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Тематика журнала: актуальные вопросы современной экономики и социологии - от теоретических и экспериментальных исследований до непосредственных результатов управленческой и производственной деятельности. Публикации в журнале учитываются как опубликованные работы при защите диссертаций на соискание ученых степеней России и зарубежья.

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- Основной раздел: социально-экономические аспекты развития современного государства;
- Современные технологии управления организацией;
- Актуальные вопросы политики и права;
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ICHKI HARBIY NIZOLAR SHAROITIDA PSIXOLOGIK BARQARORLIK VA QARSHILIKNI MODELLASHTIRISH: JANGOVAR TA'MINOTNING YANGI KONSEPSIYASI

Annotasiya. Ichki harbiy nizolar uzoq davom etishi, yuqori darajadagi noaniqlik, axborot-psixologik bosim va harbiy xizmatchilar ruhiyatiga kuchli ta'siri bilan tavsiflanadi. Bunday sharoitda psixologik barqarorlik va qarshilik jangovar samaradorlik hamda operativ barqarorlikni belgilovchi muhim omil sifatida namoyon bo'ladi. Mazkur ilmiy maqolaning maqsadi ichki harbiy nizolar sharoitida jangovar ta'minot tizimining tarkibiy qismi sifatida psixologik barqarorlik va qarshilikni ta'minlashga qaratilgan integrallashgan modelni ishlab chiqish va ilmiy asoslashdan iborat. Tadqiqot jarayonida tizimli yondashuv, strukturaviy-funksional tahlil, konseptual modellash tirish hamda xalqaro va milliy tajribani qiyosiy tahlil qilish metodlaridan foydalanildi. Tadqiqot natijasida psixologik barqarorlikning kognitiv, emotsional-regulyativ, motivatsion-irodaviy va ijtimoiy-psixologik komponentlarini o'z ichiga olgan ko'p darajali model taklif etildi. Ushbu model harbiy psixologiya nazariyasini boyitish bilan birga, ichki nizolar sharoitida shaxsiy tarkibning jangovar tayyorgarligi va barqarorligini oshirishga xizmat qiladi.

Kalit so'zlar: ichki harbiy nizo, psixologik barqarorlik, psixologik qarshilik, jangovar ta'minot, modellash tirish, axborot-psixologik ta'sir.

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MODELLING PSYCHOLOGICAL RESILIENCE AND RESISTANCE IN THE CONTEXT OF INTERNAL MILITARY CONFLICTS: A NEW CONCEPT OF COMBAT SUPPORT

Annotation. Internal military conflicts are characterised by their protracted nature, high level of uncertainty, informational and psychological pressure, and strong impact on the psyche of military personnel. In such conditions, psychological resilience and resistance are important factors determining combat effectiveness and operational stability. The aim of this scientific article is to develop and scientifically substantiate an integrated model aimed at ensuring psychological stability and resilience as an integral part of the combat support system in conditions of internal military conflicts. The research used methods of a systematic approach, structural and functional analysis, conceptual modelling, and comparative analysis of international and national experience. As a result of the research, a multi-level model was proposed, including cognitive, emotional-

regulatory, motivational-volitional, and socio-psychological components of psychological stability.

This model not only enriches the theory of military psychology, but also serves to increase the combat readiness and stability of personnel in conditions of internal conflicts.

Key words: internal military conflict, psychological stability, psychological resistance, combat support, modelling, informational and psychological influence.

“O‘zbekiston Respublikasi Qurolli Kuchlarini isloh qilish, mudofaa tizimi tashkiliy tuzilmasini modernizatsiya qilish hamda harbiylarning ma’naviy-jangovar tayyorgarligini zamonaviy talablar darajasiga ko‘tarish — davlat xavfsizligini ta’minlashning ustuvor yo‘nalishidir¹”.

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Zamonaviy xavfsizlik muhitining transformatsiyasi ichki harbiy nizolar sonining ortishi va ularning murakkablashuvi bilan tavsiflanadi. Bunday nizolar an’anaviy urushlardan farqli ravishda nosimmetrik xarakterga ega bo‘lib, uzoq davom etishi, fuqarolik muhitida olib borilishi va doimiy psixologik bosim bilan kechishi bilan ajralib turadi [1, 5]. Ushbu sharoitda harbiy xizmatchilarning psixologik holati ularning jangovar vazifalarni samarali bajarish qobiliyatini belgilovchi asosiy omillardan biriga aylanadi.

Muallif pozitsiyasiga ko‘ra, ichki harbiy nizolar sharoitida psixologik barqarorlikni faqat individual shaxsiy xususiyatlar bilan izohlash yetarli emas. Aksincha, u jangovar ta’minot tizimining integral elementi sifatida ko‘rib chiqilishi lozim. Chunki uzoq muddatli stress, axborot-psixologik bosim va ijtimoiy noaniqlik sharoitida individual resurslar tizimli qo‘llab-quvvatlashsiz tez susayadi.

An’anaviy jangovar ta’minot tizimlari asosan moddiy-texnik, logistika va operativ komponentlarga tayanadi. Biroq tadqiqotlar shuni ko‘rsatadiki, psixologik omillar e’tibordan chetda qolgan sharoitda hatto yuqori texnik ta’minot ham kutilgan natijani bermaydi [2, 3]. Shu sababli psixologik barqarorlik va qarshilikni jangovar ta’minotning ajralmas tarkibiy qismi sifatida qayta konseptualizatsiya qilish dolzarb ilmiy va amaliy vazifa hisoblanadi.

Adabiyotlar sharhi

Harbiy psixologiya va ekstremal faoliyat psixologiyasi doirasida psixologik barqarorlik tushunchasi keng tadqiq etilgan. Jumladan, P. Bartone psixologik barqarorlikni operativ stress sharoitida shaxsning funksional samaradorligini saqlab qolish qobiliyati sifatida talqin etadi [1, 4–6-betlar]. Uning fikricha, barqarorlik

¹ 2026-yil 13-yanvardagi Xavfsizlik kengashining mamlakatimiz harbiy xavfsizligi va mudofaasini mustahkamlash masalalari bo‘yicha kengaytirilgan yig‘ilishi vazifalaridagi nutqidan

individual xususiyat bo'lishi bilan birga, harbiy tashkilot tomonidan shakllantiriladigan tizimli omillarga ham bog'liq.

G. Bonanno psixologik barqarorlikni travmatik hodisalardan keyin tiklanish va moslashuvchanlik qobiliyati bilan bog'lab, uni patologiyaga qarama-qarshi tabiiy jarayon sifatida izohlaydi [2, 22–24-betlar]. Ushbu yondashuv ichki harbiy nizolar sharoitida harbiy xizmatchilarning doimiy stressga moslashish mexanizmlarini tushuntirishda muhim nazariy asos bo'lib xizmat qiladi.

S. Maddining "hardiness" nazariyasida esa psixologik barqarorlik majburiyatga sadoqat, vaziyat ustidan nazorat hissi va qiyinchiliklarni rivojlanish omili sifatida qabul qilish bilan izohlanadi [3, 261-bet]. Muallif ushbu pozitsiyani qo'llab-quvvatlagan holda ta'kidlaydiki, mazkur sifatlar ichki nizolar sharoitida harbiy xizmatchilarning uzoq muddatli psixologik chidamliligini ta'minlashda hal qiluvchi ahamiyatga ega.

Shu bilan birga, NATO va boshqa xalqaro harbiy-tahliliy markazlar tomonidan olib borilgan tadqiqotlarda psixologik barqarorlik harbiy tayyorgarlik va jangovar tayyorgarlikning ajralmas tarkibiy qismi sifatida baholanadi [4, 45–50-betlar]. Biroq muallif pozitsiyasiga ko'ra, mavjud tadqiqotlarda psixologik barqarorlikni jangovar ta'minot tizimi doirasida modellashtirish masalasi yetarlicha chuqur ishlab chiqilmagan.

Tadqiqot metodologiyasi

Mazkur tadqiqot sifat jihatidan konseptual xarakterga ega bo'lib, quyidagi ilmiy metodlarga asoslanadi:

- jangovar ta'minot tizimining tizimli va strukturaviy-funksional tahlili;
- psixologik barqarorlik va qarshilikni konseptual modellashtirish;
- xalqaro (NATO) va milliy harbiy-psixologik yondashuvlarni qiyosiy tahlil qilish;
- ekspert baholash va kontent-tahlil metodlari.

Tadqiqotning metodologik asosi sifatida harbiy psixologiya nazariyasi, ijtimoiy tizimlar nazariyasi hamda xavfsizlik tadqiqotlari konsepsiyalari qabul qilindi.

Tadqiqot natijalari va muhokama

Psixologik barqarorlik va qarshilikning ierarxik modeli (muallif yondashuvi). Ichki harbiy nizolar sharoitida psixologik barqarorlikni samarali ta'minlash uchun uni tasodifiy psixologik choralar majmui sifatida emas, balki qat'iy ierarxik tuzilishga ega bo'lgan tizim sifatida modellashtirish zarur. Muallif pozitsiyasiga ko'ra, bunday yondashuv jangovar ta'minot tizimida psixologik omillarni rejalashtirish, boshqarish va baholash imkonini beradi.

Quyida taklif etilayotgan ierarxik jadval psixologik barqarorlik va qarshilikning darajalari, ularning funksional vazifalari hamda jangovar ta'minot bilan bog'liqligini aks ettiradi.

Ichki harbiy nizolar sharoitida psixologik barqarorlik va qarshilikning ierarxik modeli (muallif modeli)

1-jadval

Ierarxik daraja	Asosiy komponent	Mazmuniy tavsif	Jangovar ta'minotdagi funksiyasi
Strategik daraja	Ma'naviy-psixologik barqarorlik	Qadriyatlar, xizmat burchiga sadoqat, ma'naviy motivatsiya	Uzoq muddatli jangovar barqarorlikni ta'minlash
Operativ daraja	Motivatsion-irodaviy barqarorlik	Qaror qabul qilishda qat'iyat, mas'uliyat, stressga bardoshlilik	Vazifalarni uzluksiz bajarish
Taktik daraja	Emotsional-regulyativ barqarorlik	Emotsiyalarni boshqarish, affektiv holatlarni nazorat qilish	Jangovar vaziyatda xatti-harakatlar barqarorligi
Instrumental daraja	Kognitiv va axborot barqarorligi	Axborotni tanqidiy baholash, dezinformatsiyaga qarshilik	Qarorlar sifatini oshirish
Ijtimoiy daraja	Jamoaviy-psixologik barqarorlik	Jipslik, liderlikka ishonch, kommunikatsiya	Bo'linma ichki muvozanatini saqlash

Muallif ta'kidlaydiki, mazkur ierarxik darajalar o'zaro qat'iy subordinatsiyada bo'lib, yuqori darajadagi psixologik barqarorlik quyi darajalarning samarali ishlashini belgilaydi. Masalan, strategik darajadagi ma'naviy-psixologik barqarorlik yetarli darajada shakllanmagan sharoitda taktik yoki instrumental darajadagi psixologik choralar kutilgan natijani bermaydi (*mazkur tadqiqot konseptual xarakterga ega bo'lib, uning asosiy maqsadi ichki harbiy nizolar sharoitida psixologik barqarorlikni tizimli modellashirishdan iborat. Modelning empirik verifikatsiyasi keyingi tadqiqotlar doirasida amalga oshirilishi rejalashtirilgan*).

Shu nuqtai nazardan, muallif tomonidan taklif etilayotgan ierarxik model ichki harbiy nizolar sharoitida jangovar ta'minotni rejalashtirishda psixologik omillarni ustuvorliklar asosida joylashtirish imkonini beradi va mavjud yondashuvlardan o'zining tizimliliği bilan farq qiladi (muallif tomonidan psixologik barqarorlik va qarshilik ichki harbiy nizolar sharoitida jangovar ta'minot tizimining mustaqil va ierarxik elementi sifatida birinchi bor konseptual modellashirildi).

O'tkazilgan tahlillar ichki harbiy nizolar sharoitida psixologik barqarorlik ko'p o'lchamli va dinamik tizim ekanligini ko'rsatdi. Bartone va Bonanno tadqiqotlari asosida shuni ta'kidlash mumkinki, psixologik barqarorlik nafaqat stressga chidamlilik, balki vaziyatga moslashish va funksional faoliyatni saqlab qolish qobiliyatini ham o'z ichiga oladi [1; 2].

Muallif tomonidan taklif etilayotgan model ushbu nazariy yondashuvlarni umumlashtirgan holda quyidagi to'rtta asosiy komponentni o'z ichiga oladi:

Kognitiv komponent – vaziyatni adekvat idrok etish, axborotni tanqidiy baholash va dezinformatsiyaga qarshi turish qobiliyati. Tadqiqotlarga ko'ra, noto'g'ri axborot jangovar qarorlar sifatiga bevosita salbiy ta'sir ko'rsatadi [5, 228–230-betlar].

Emotsional-regulyativ komponent – stressga chidamlilik, emotsional o‘zini boshqarish va psixologik zo‘riqlashlarning oldini olish. Bu jihat NATO hisobotlarida ham alohida urg‘u bilan qayd etilgan [4, 60–65-betlar].

Motivatsion-irodaviy komponent – xizmat burchiga sadoqat, ma’naviy qadriyatlar va barqaror jangovar motivatsiya. Muallif fikricha, mazkur komponent ichki nizolar sharoitida shaxsiy tarkibning ma’naviy yemirilishining oldini olishda markaziy o‘rin tutadi.

Ijtimoiy-psixologik komponent – bo‘linma ichidagi jipslik, liderlikka ishonch va samarali kommunikatsiya. Tadqiqotlar jamoaviy ishonch darajasi yuqori bo‘lgan bo‘linmalarda psixologik yo‘qotishlar sezilarli darajada kam bo‘lishini ko‘rsatadi [6, 18–22-betlar].

Muallif pozitsiyasiga ko‘ra, mazkur komponentlarni jangovar ta‘minot tizimiga integratsiya qilish psixologik barqarorlikni reaktiv choralar majmui sifatida emas, balki doimiy va oldindan rejalashtirilgan strategik jarayon sifatida shakllantirish imkonini beradi.

Ichki harbiy nizolar sharoitida psixologik barqarorlik va qarshilikni modellashtirish jangovar ta‘minot tizimini takomillashtirishning muhim yo‘nalishlaridan biridir. Mazkur tadqiqotda ishlab chiqilgan konseptual model nazariy jihatdan asoslangan bo‘lib, harbiy boshqaruv va psixologik ta‘minot tizimida amaliy qo‘llash imkoniyatiga ega.

Tadqiqot natijalari harbiy psixologiya fanini rivojlantirishga hissa qo‘shadi hamda kelgusida empirik tadqiqotlar va normativ-huquqiy hujjatlarni takomillashtirish uchun ilmiy asos bo‘lib xizmat qilishi mumkin.

ADABIYOTLAR RO‘YXATI

1. Bartone P.T. Resilience under military operational stress // *Military Psychology*. — 2006. — Vol. 18, No. 1. — P. 1–17.
2. Bonanno G.A. Loss, trauma, and human resilience: Have we underestimated the human capacity to thrive after extremely aversive events? // *American Psychologist*. — 2004. — Vol. 59, No. 1. — P. 20–28.
3. Maddi S.R. On hardiness and other pathways to resilience // *American Psychologist*. — 2005. — Vol. 60, No. 3. — P. 261–262.
4. NATO Science and Technology Organization. Psychological resilience and military readiness. — Brussels: NATO STO, 2019. — P. 45–78.
5. Everly G.S., Mitchell J.T. The critical incident stress management approach to disaster intervention // *Aggression and Violent Behavior*. — 2008. — Vol. 13, No. 4. — P. 227–232.
6. O‘zbekiston Respublikasi Prezidentining 2018-yil 4-avgust kunidagi “O‘zbekiston Respublikasi Qurolli Kuchlari harbiy xizmatchilarining ma’naviy-ma’rifiy saviyasini oshirish tizimini tubdan takomillashtirish to‘g‘risida”gi PQ-3898-son qarori. — Toshkent, 2020. — 12–27-betlar.

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INTEGRATSION YONDASHUV HAMDA KASB-HUNARNING MOHIYATI VA NAZARIY JIHATDAN TAHLILI

Annotatsiya. Maqolada ta'limga integratsion yondashuv mazmuni, kasb-hunarga tayyorlashni integratsiyalash hamda nazariy va amaliy kasbiy ta'limni uyg'unlashtirish, bo'lajak mutaxassislarning kasbiy kompetensiyalarini shakllantirish masalalari talqin qilingan.

Kalit so'zlar: o'quvchi, ta'lim, jarayon, mazmun, kasb-hunar, hamkorlik, integratsiya, yondashuv, natija.

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AN INTEGRATIVE APPROACH AND ANALYSIS OF THE PROFESSION'S ESSENCE AND THEORETICAL ASPECTS

Annotation. The article interprets the content of an integrative approach to education, the integration of vocational training and the combination of theoretical and practical vocational education, and the formation of professional competencies of future specialists.

Key words: student, education, process, content, profession, collaboration, integration, approach, outcome.

Ta'lim tizimida o'quvchilarga ta'lim va tarbiya berishning murakkab vazifalarini hal etish o'qituvchilarning bilimi, malakasi, kasbiy mahorati, iqtidori, iste'dodi va madaniyatiga hamda dars jarayonida yangi pedagogik va axborot texnologiyalaridan foydalana olish faolligiga bog'liqdir. Shuning uchun ham bugungi kunda zamonaviy ta'lim texnologiyalari tizimi yaratilib, uning asosiy vazifasi ta'lim tizimidagi ta'lim mazmuni uzluksizligi va uzviyligini ta'minlash, fanlarni o'qitish uslubiyatini takomillashtirish, o'quv jarayoniga pedagogik va axborot texnologiyalarini joriy etishdan iborat bo'ladi. Bugungi kunda har bir mutaxassis o'z sohasini mukammal bilish bilan bir qatorda kompyuter va axborot texnologiyalarini etarlicha o'zlashtirgan bo'lishi kerak. Chunki hozirgi kunda ta'lim tizimini axborot texnologiyalarisiz tasavvur qilib bo'lmaydi. Bugungi kunda barcha ta'lim muassasalarida ta'lim olayotgan barcha o'quvchilar kompyuter va axborot texnologiyalarini mukammal o'rgangan, o'zlashtirgan va amaliyotga tatbiq eta oladigan bo'lishi dolzarb masalalardan biriga aylanmoqda. Ayniqsa, dars jarayonida fanlarni bir-biri bilan bog'lab o'tish, o'tilgan mavzuni osonroq tushunishga va ularni o'zlashtirishga olib keladi.

Asosiy qism. Innovatsion ta'lim tizimining eng muhim jihatlaridan biri uning bosqichlari o'rtasidagi hamda fanlararo integratsiyasini ta'minlashdan iboratdir. Shuning uchun ham ta'limning turli bosqichlarida integratsiya, uzviylik va uzluksizlikni ta'minlash metodikasini ishlab chiqish masalasi har doim ta'lim tizimining dolzarb muammolaridan hisoblangan. Integratsiya –juda keng ma'nodagi tushuncha. Integratsiya nima? “Integratsiya” –lotincha “integration” so‘zidan olingan bo‘lib, “integr” to‘liq yaxlit, bir butun degan ma’nolar anglatadi. Integratsiya –o‘zaro bog‘langan holda rivojlantirish, bir butun qilib birlashtirmoq, yaxlit holga keltirmoq deganidir. Integratsiya turli xil qism va elementlarni bir butunlikka birlashtirish jarayonidir. Integratsiya jarayonlari tashkillashtirilgan tizimlarda bo‘lishi mumkin –bu holda ular tizim butunlik darajasini va tashkillashtirilgan darajasini ko‘taradi. Integratsiya jarayonlari oldin bog‘lanmagan elementlarni biriktirish asosini hamda shakllangan tizimlarda ham yuz berib, natijada tizimni bir butunligi va tashkillanish darajasi oshishiga, element va tarkibiy qismlar o‘rtasida aloqadorlik murakkablashuviga olib keladi. Bir butunlikka birikkan tarkibiy qismlar turli xil darajada avtonomlikka ega bo‘ladi.

Integratsiya –obyektiv hayotiy jarayon. Globallashtayotgan hozirgi hayotning integratsiyalashuv jarayonida mustaqillikni saqlab qolish dolzarb vazifaga aylanmoqda. Bu esa xalqaro hamkorlikda quyidagi prinsiplarga qat’iy amal qilishni taqozo etmoqda: integratsiyalashgan birlashmalarga faqat tomonlarning tengligi asosida qo‘shilish lozim (hatto siyosiy-iqtisodiy potensial turli-tuman bo‘lgan taqdirda ham); milliy manfaatlar deklaratsiyasiga asoslanish, ularning mintaqaviy va boshqa manfaatlar oldida ustuvorligi; ishtirok etishning ixtiyoriyligi va u yoki bu ittifoqni tanqid qilish imkoniyati mavjudligi.

Ilmiy bilimning informativligi muammosiga nisbatan qiziqish fanning hozirgi davrdagi rivojlanish qonuniyatlari, avvalo uning samaradorligini oshirishga ko‘maklashuvchi bilishdagi integratsiya jarayonlari bilan belgilanadi. Fan integratsiyalashuvining muhim unsurlaridan biri bo‘lgan ilmiy axborot integratsiyasi ilmiy axborotning bir-biriga, fanning bir tarmog‘idan boshqa tarmog‘iga o‘tishida namoyon bo‘ladi. Hozirgi zamon fanining mantiqiy-gnoseologik asoslaridan biri sanalgan integratsiya ilmiy bilimning informativlik darajasi va asosiy informatsion imkoniyatlarini o‘zgartiradi. Bu bilimning bir darajasidan boshqa darajasiga, narsalar va hodisalar mazmunini yanada teranroq aks ettiruvchi bilimga o‘tishi bilan bog‘liq. Integrativ jarayonlar nazariy tizimlarning teranlik darajasini oshirib, nazariya va empirik ma’lumotlarning qo‘llanish doirasini kengaytiradi. Nazariya mazmunining yanada teranlashuvi informativlik darajasining oshishiga sabab bo‘ladi, tushunchalar haqidagi axborotning integrativ jarayonlarga ta’sir ko‘rsatish imkoniyatini ro‘yobga chiqarishga ko‘maklashadi.

Mamlakatimizda uzluksiz ta'lim tizimida olib borilayotgan keng qamrovli islohotlarning asosiy maqsadlaridan biri yoshlarni chuqur bilim olishlari, iste’dodlarini ro‘yobga chiqarishda har tomonlama qo‘llab-quvvatlash, shu bilan birgalikda ularning mustaqil hayotga tayyorlash ko‘nikmalarini ham shakllantirib borish ta'lim tizimining ustuvor yo‘nalishlaridan biri hisoblanadi. Kasb tanlashga yo‘naltirish davlatning chora-tadbirlari tizimidan iborat bo‘lib shaxs tomonidan

tanlanadi va - maktabda kasbiy ma'lumotlar berish; quyidagi shakllarda amalga oshiriladi:

- ✓ kasb- hunar maorifi bilan shug'ullanish;
- ✓ radio, televidenie, kino, matbuotda tashviqot qilish;
- ✓ kasb yuzasidan maslahatlar;
- ✓ kasbga saralash (qobiliyatiga binoan);
- ✓ kasbga moslashish (adaptatsiyalash).

Kasbning mazmunini va mohiyatini tushunmaslik o'quvchilarda tanlagan kasbga munosabatining salbiylashishiga olib keladi. Bunday holatning oldini olish uchun quyidagi tadbirlarni amalga oshirish maqsadga muvofiqdir:

- O'quv materiallarini, umuman ta'limni hayot bilan bog'lash.
- Ma'lumotlarni o'zlashtirishda shaxsiy faollikni shakllantirish.
- O'tgan bosqichdagi faoliyatdan qoniqish va kelgusi faoliyat uchun ijobiy zamin hozirlash.
- Istiqbol rejani muvofiqlashtirish va yosh bosqichining yuqorilashuviga qarab buni takomillashtirib borish.
- O'quv-uslubiy qiyinchilik bilan shaxsiy nomurosasizlik belgilari o'rtasidagi uzviylikni yo'qotish.
- Kasbiy faoliyat hayotning muhim qismi bo'lib, ishdagi muvaffaqiyatlar o'ziga ishonishga yordam berishligini inobatga olish.

Xulosa. Hozirgi vaqtda integratsiya –raqobatbardosh kadrlar ichki va tashqi bozorida ishlab chiqaruvchilar o'rtasidagi raqobat kurashining muhim vositalaridan hisoblanadi va bunday kadrlarni tayyorlash maxsus ilmiy tadqiqotlar o'tkazishni, ularni ta'lim jarayonida amalda qo'llashni talab etadi.

Foydalanilgan adabiyotlar:

1. Boboev X. "Avesto" –Sharq xalqlarining bebaho yodgorligi "Avesta" – Bessennoe bogatstvo narodov Vostoka // Toshkent moliya instituti. –Toshkent, 2004. –56 b.
2. Djuraev R.X. va boshqalar. Pedagogik amalar lug'ati. Toshkent, 2008. 135-b.
3. Maklakov A.G. Общая психология // Серия «Учебник нового века». –SPb.: Piter, 2001. –592 s. ISBN 5-272-00062-5.
4. Mustaqillik. Izohli ilmiy-ommabop lug'at // –Toshkent: "Sharq", 2000. –269 b.
5. Мачулис В.В. Роль новых информационных технологий в обеспечении преемственности естественнонаучного образования в средней и высшей школе // дисс.рел.ру. –М.:ПГБ, 2003. –152 с.
6. Mamutov U.B. Kasbiy pedagogik ta'lim tizimi uzviyligi va uzluksizligini ta'minlash masalalari // Respublika ilmiy-amaliy konferensiya materiallari. –Toshkent, 2006. –155-157 b.
7. Mirzaxmedov M.A., Narmanov A.J. Uzluksiz ta'lim tizimida yangi pedagogik texnologiyalardan foydalanish // Uzluksiz ta'lim ilmiy -uslubiy jurnal. –Toshkent, 2004. –No 5. –46-55 b.
8. Nazarov Q.N., To'ychiev B., Xaydarov X., O'tamurodov A., To'xtarov I., To'raev Sh. Ijtimoiy falsafa // O'quv qo'llanma. –Toshkent, 2008. –235 b.

- 9.Спенсер Г. Политические сочинения: в 5 томах. 3-е изд.//–Челябинск: Социум, 2020. –Т.3. История политических институтов. –426 с.
- 10.Сазонова З.С. Интеграция образования, науки и производства как методологическое основание подготовки современного инженера // Автореферат док. канд. наук. –Казань, 2008. –С 18.
- 11.Спенсер Г. Политические сочинения: в 5 томах. 3-е изд.//–Челябинск: Социум, 2020. –Т.3. История политических институтов. –426 с.
- 12.Smend, Rudolf.In:Kürschners Deutscher Gelehrtenkalender//Biobibliographisches Verzeichnis deutschsprachiger Wissenschaftler der Gegenwart.Ausgabe. –Gruyter, Berlin, 2016. –Z.28.
- 13.Xasanboev J.J., To‘raqulov X.A., Xaydarov M.E., Xasanbaeva O.U. Pedagogika fanidan izohli lug‘at. O‘zbekiston Respublikasi FA «Fan» nashriyoti, 2006 y. 238-b.

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BO'LAJAK BIOLOGIYA FANI O'QITUVCHILARINING KASBIY TAYYORGARLIGINI TAKOMILLASHTIRISH (QUSHLAR SINFI MISOLIDA)

Annotatsiya. Ushbu maqola bo'lajak biologiya fani o'qituvchilarining kasbiy tayyorgarligini takomillashtirish masalasiga bag'ishlangan bo'lib, qushlar sinfi misolida ta'lim jarayonida pedagogik va ilmiy yondashuvlar tahlil qilinadi. Tadqiqotda kasbiy kompetensiyalarni shakllantirish, o'qituvchilarda biologik bilim va ko'nikmalarni rivojlantirish metodlari, zamonaviy ta'lim texnologiyalaridan foydalanishning samaradorligi o'rganilgan. Maqolada metodologik asoslar, ilmiy manbalar tahlili va amaliy tadqiqot natijalari keltirilgan.

Kalit so'zlar: biologiya fani, qushlar sinfi, kasbiy tayyorgarlik, o'qituvchi kompetensiyasi, ta'lim metodikasi, pedagogik innovatsiya.

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IMPROVING THE PROFESSIONAL TRAINING OF FUTURE BIOLOGY TEACHERS (ON THE EXAMPLE OF THE CLASS AVES)

Annotation. This article is dedicated to the issue of improving the professional training of future biology teachers, using the class of birds as an example. The study analyzes pedagogical and scientific approaches in the educational process. It examines methods for developing professional competencies, enhancing students' biological knowledge and skills, and the effectiveness of using modern educational technologies. The article presents methodological foundations, a review of scientific sources, and the results of practical research.

Keywords: biology, class of birds, professional training, teacher competency, teaching methodology, pedagogical innovation.

Kirish. Biologiya fani o'qituvchilarining kasbiy tayyorgarligi zamonaviy ta'lim jarayonining sifatini belgilovchi asosiy omillardan biridir. Ayniqsa, qushlar

sinfi kabi ekologik va biologik jihatdan murakkab mavzularni o'qitish, o'qituvchidan chuqur bilim, metodik kompetensiya va pedagogik mahorat talab qiladi. Hozirgi kunda ta'lim jarayonida faqat nazariy bilimlar berish yetarli emas; talabalar amaliy ko'nikmalar, tadqiqot va kuzatuv faoliyatini rivojlantiruvchi metodlar bilan tanishtirilishi lozim. Shu nuqtai nazardan, bo'lajak biologiya fani o'qituvchilarini tayyorlashda qushlar sinfi misolida metodik yondashuvlarni o'rganish va ularni takomillashtirish ahamiyati ortmoqda.

Ushbu maqolaning maqsadi – bo'lajak o'qituvchilarning kasbiy tayyorgarligini qushlar sinfi mavzulari misolida aniqlash, zamonaviy pedagogik texnologiyalar va metodlarni joriy etish imkoniyatlarini tahlil qilishdir. Tadqiqot vazifalari sifatida quyidagilar belgilangan: birinchidan, biologiya o'qituvchilarining kasbiy kompetensiyasini shakllantirishda asosiy omillarni aniqlash; ikkinchidan, qushlar sinfi mavzularini o'qitishda qo'llaniladigan metod va texnologiyalarni o'rganish; uchinchidan, ta'lim jarayonida samarali amaliy mashg'ulotlarni ishlab chiqish va tajriba natijalarini tahlil qilish.

Adabiyotlar tahlili va metodologiya. So'nggi yillarda biologiya fani o'qituvchilarining tayyorgarligi bo'yicha bir qancha ilmiy ishlanmalar mavjud. Masalan, Akbarov M. va Hamidova D. (2020) o'qituvchilarning biologik kompetensiyalarini shakllantirishda interfaol metodlardan foydalanishning samaradorligini tadqiq qilganlar. Ularning tadqiqot natijalariga ko'ra, qushlar sinfi mavzularini amaliy laboratoriya va kuzatuv mashg'ulotlari orqali o'rgatish o'quvchilarda ekologik ong va biologik tushunchalarni mustahkamlashga xizmat qiladi. Shuningdek, Nazarova R. (2019) biologiya fani o'qituvchilarining pedagogik kompetensiyalarini oshirish uchun innovatsion metodlarni joriy etish zarurligini ta'kidlaydi.

Metodologik asos sifatida tadqiqotda quyidagi yondashuvlar qo'llanildi: pedagogik kuzatuv, so'rovnoma, test va amaliy laboratoriya mashg'ulotlari. Tadqiqot ishtirokchilari sifatida Toshkent shahridagi pedagogika institutining biologiya yo'nalishi bo'yicha tahsil olayotgan 50 nafar bo'lajak o'qituvchi tanlandi. Ma'lumotlarni yig'ishda qushlar sinfi mavzularini o'qitish jarayonidagi metodik yondashuvlar va o'quvchilarning biologik bilim darajasiga bo'lgan ta'siri tahlil qilindi.

Muhokama va natijalar. Tadqiqot natijalari ko'rsatdiki, bo'lajak biologiya fani o'qituvchilarining kasbiy tayyorgarligi quyidagi jihatlar bo'yicha tahlil qilinadi: nazariy bilim, amaliy ko'nikmalar va pedagogik yondashuvlar.

Jadval 1.

Bo'lajak o'qituvchilarning qushlar sinfi mavzularini o'qitish bo'yicha tayyorgarlik darajasi (%)

Tayyorlik ko'rsatkichi	Yuqori	O'rtacha	Past
Nazariy bilim	40	50	10
Amaliy ko'nikmalar	35	45	20
Pedagogik yondashuv	30	50	20

Jadvaldan ko‘rinib turibdiki, bo‘lajak o‘qituvchilarning nazariy bilim darajasi nisbatan yuqori, lekin amaliy ko‘nikmalar va pedagogik yondashuvlarda pastlik mavjud. Shu sababli, metodik yondashuvlarni takomillashtirish zarur.

Tadqiqot davomida quyidagi metodlar samarali deb topildi: interaktiv darslar, laboratoriya va maydon mashg‘ulotlari, kuzatuv ishlarini tashkil etish, multimediya vositalari yordamida qushlarning biologik xususiyatlarini o‘rgatish.

Jadval 2.

Qushlar sinfi mavzularini o‘rgatishda metodlarning samaradorligi (%)

Metod	Yuqori samaradorlik	O‘rtacha	Past samaradorlik
Interaktiv darslar	45	40	15
Laboratoriya mashg‘ulotlari	50	35	15
Maydon kuzatuvlari	40	45	15
Multimedialar	35	50	15

Tahlil shuni ko‘rsatadiki, amaliy mashg‘ulotlar va maydon kuzatuvlari eng samarali metodlar bo‘lib, o‘quvchilarda qiziqish va bilim mustahkamligini oshiradi.

Shuningdek, so‘rovnoma natijalari bo‘yicha bo‘lajak o‘qituvchilar pedagogik yondashuvni takomillashtirish zarurligini qayd etishgan. Bu esa biologiya fanini chuqur va qiziqarli o‘rgatishning muhim omilidir.

Xulosa. Tadqiqot natijalari shuni ko‘rsatdiki, bo‘lajak biologiya fani o‘qituvchilarining kasbiy tayyorgarligini oshirishda qushlar sinfi mavzulari samarali vosita bo‘lishi mumkin. Nazariy bilimlar yetarli bo‘lsa-da, amaliy ko‘nikmalar va pedagogik yondashuvlarda kamchiliklar mavjud. Shu sababli, ta’lim jarayonida laboratoriya mashg‘ulotlari, maydon kuzatuvlari, interaktiv va multimediya vositalarini keng qo‘llash tavsiya etiladi.

Shuningdek, bo‘lajak o‘qituvchilarni tayyorlash jarayonida kasbiy kompetensiyalarni rivojlantirish uchun doimiy metodik treninglar, seminarlar va tajriba almashuvlari o‘tkazish zarur. Bu o‘qituvchilarning nafaqat bilim darajasini, balki pedagogik mahoratini ham oshiradi.

Qushlar sinfi misolida olib borilgan tadqiqot pedagogik va biologik bilimlarni integratsiyalash, amaliy va nazariy bilimlarni uyg‘unlashtirish orqali o‘qituvchilarning kasbiy tayyorgarligini samarali oshirish imkoniyatini beradi. Kelajakda bunday yondashuvlarni boshqa biologik mavzularga kengaytirish ham muhim ahamiyatga ega.

Umuman olganda, zamonaviy pedagogik texnologiyalar, amaliy mashg‘ulotlar va kuzatuv ishlarini uyg‘unlashtirish bo‘lajak biologiya fani o‘qituvchilarining kasbiy tayyorgarligini sezilarli darajada oshiradi va o‘quvchilarning biologik bilimini mustahkamlaydi.

FOYDALANILGAN ADABIYOTLAR

1. Akbarov M., Hamidova D. — Biologiya fani o‘qituvchilarining kasbiy kompetensiyalari — Toshkent: Fan, 2020. – 78-b.
2. Nazarova R. — Pedagogik innovatsiyalar va biologiya ta’limi — Samarqand: Universitet nashriyoti, 2019. – 56-b.

3. Xodiyev B. Yu. va bosh. — Siyosatshunoslik fanidan o'quv uslubiy qo'llanma — T.: TDIU, 2005. — 94-b.
4. Karimova L. — Biologiya fani o'qituvchilarining metodik tayyorgarligi — Buxoro: BuxDU, 2018. — 112-b.
5. Raximov O. — Ekologik va biologik bilimlarni o'qitish metodikasi — Toshkent: Noshir, 2021. — 89-b.
6. Tursunov S. — O'qituvchi kasbiy tayyorgarligini oshirishning innovatsion usullari — Qarshi: Qarshi DU, 2020. — 67-b.

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GEOSISTEMALARNING TUZILMASI

Аннотация: maqolada “geosistema” tushunchasi, ta’riflanishi, tuzilmasi va xillari xususida fikr-mulohazalar bayon qilingan.

Калит сўзлар: geosistema, geografik yondashuv, tabiiy geosistema, ijtimoiy geosistema, geosistemaning tuzilmasi, guruhlanishi.

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STRUCTURE OF GEOSYSTEMS

Abstract: the article presents discussions on the concept, definitions, structure and main types of geosystems.

Keywords: geosistem, geosystem aproach, natural geosystems, social geosystems, structure of geosystems, main types.

Geografiyaning tadqiqot amaliyotiga sistemali yondashuvning keng tadbiiq etilishiga bogʻliq holda turli xildagi va kattalikdagi hududiy (geografik) sistemalar, ularning shakllanishi, tuzilmasi, dinamikasi, tarixiy rivojlanishi va kelgusidagi oʻzgarishlari geografiyaning predmeti deb tan olindi. Vaqt oʻtishi bilan geografiyada bir qancha sinonimlari boʻlgan “hududiy sistema” sistemali yondashuvning asosiy tushunchasi boʻlib qoldi. Bu tushunchalardan biri “geografik sistema” tushunchasi boʻldi. Qulaylik uchun koʻp hollarda geografik sistemalar qisqartirilgan holda geosistemalar ham deyiladi. “Geosistema” termini dastlab B.V.Sochava tomonidan 1963-yilda rus tilida tabiat komplekslari uchun qoʻllanildi, keyinchalik ingliz (1967) va nemis (1969) tillaridagi geografik adabiyotlarda qoʻllanila boshlandi [7].

Geografik sistemalar atrof muhitni va geografik qobiqni yaxlit moddiy sistema sifatida shakllantiradi. “Geosistema” tushunchasi xilma-xil talqin qilinisada, ularning barchasi geosistemalarni Yer yuzasida real mavjud boʻlgan,

yalpi umumiy aloqa, oʻzaro taqoza va rivojlanish prinsiplariga boʻysunadigan sistema sifatida tan olinishidir. “Geosistema” termini obyektning sistemali mohiyatini, uning tabiatdagi uyushuvning universal shakli sifatidagi sistemalarga mansubligini ifodalaydi.

Geografiyada sistemali yondashuv geografik obyektlarni sistema, yaʼni har xil, ammo birlikka ega boʻlgan oʻzaro bogʻliq elementlardan tashkil topgan hosilalar sifatida tadqiq qilish boʻlib, bu yondashuv geografik sistemalarning (geosistema) alohida sinfi toʻgʻrisidagi tasavvurlarning shakllanishiga, geografik tadqiqotlarga jalb qilinadigan (sotsial sistemalar, “tabiat-texnika”, “tabiat-jamiyat” sistemalari) obyektlar sonini, obyektlar va hodisalarning xossalari kengayishiga, geografik obyektlarning turli xil modellarini tadqiq qilishda umumiy yondashuvlarni aniqlanishiga imkon berdi. Geografiyada sistemali yondashuv asosida ilgari oʻrganilgan tabiiy va ishlab chiqarish komplekslarining bir qator xossalari chuqurroq oʻrganila boshlandi.

Dastlab tabiiy-geografik tushuncha hisoblanilgan “geosistema” umumgeografik tushunchaga aylandi. Keyinroq bir paytning oʻzida tabiat elementlarini, aholi va uning moddiy va maʼnaviy madaniyatining barcha jihatlarini oʻz ichiga oladigan tabiiy–ijtimoiy sistemalarni oʻz ichiga oladigan murakkab makoniy sotsial-iqtisodiy hosilalar uchun qoʻllanila boshlandi. Boshqa olimlarning nazarida bu tushuncha yer yuzasida shakllanadigan har qanday hududiy komplekslar uchun qoʻllanilishi mumkin. “Geosistema” tushunchasining bunday keng talqini turli mutaxassislik geograflarining oʻz ishlarida sistemali yondashuvdan samarali foydalana olish imkoniyatlari bilan bogʻliq. Shu sababli geosistema tushunchasini hududiy obyektlarning barcha xillari uchun qoʻllash maqsadga muvofiq. Bunday holda geosistema – tabiat, aholi va uning hayot faoliyati bilan chambarchas bogʻliqlikda va oʻzaro taʼsirida hosil boʻlgan nisbatan yaxlit hududiy birlik. Uning yaxlitligi geosistemaning quyi sistemalari oʻrtasida rivojlanayotgan toʻgʻridan-toʻgʻri, teskari va kichik geosistemalar orasida rivojlanadigan oʻzgargan aloqalar bilan belgilanadi.

Muayyan kichik sinfga mansub obyektlarni tavsiflashda terminga uning tur tavsifini ifodalaydigan sifat qoʻshiladi. Masalan, tabiiy geosistema, sotsial-iqtisodiy sistema va b. Tabiiy geografiya va ijtimoiy (sotsial-iqtisodiy) geografiya bir-biridan farq qiladigan tadqiqot predmetlariga ega. Tabiiy geografiyaning tadqiqot predmetini tabiiy sistemalar yoki komplekslar (lot. complexus aloqa, birikma), sotsial–iqtisodiy geografiyaning tadqiqot predmetini esa hududiy ijtimoiy sistemalar (komplekslar), yaʼni keng mazmundagi geosistemalar va ularning komponentlari tashkil etadi. Ammo, bu har ikkala sistemalar bir-biridan alohida holda mavjud emas, balki ular bir-biriga taʼsir koʻrsatadi va Yer yuzasidagi moddiy olamning birligini hosil qiladi. Koʻp yillardan buyon geografiyada turli sajiyadagi hududiy sistemalar tadqiq qilib kelinmoqda. Shu sababli geografiya oʻrganadigan barcha sistemalarni geografik sistemalar (geosistemalar) deb atash maqsadga muvofiq.

Geografiya fanlari sistemasida birinchi navbatda tabiiy (tabiiy–geografik) va ijtimoiy (sotsial–iqtisodiy) geografik fanlar sistemalari ajratiladi. Muayyan kichik

sinfga mansub obyektlarni tavsiflashda terminga uning tur tavsifini ifodalaydigan sifat qo`shiladi .Masalan, tabiiy geosistema, sotsial-iqtisodiy sistema va b. Tadqiqotlar jarayonida makoniy sistemalar sajiyasiga ko`ra *tabiiy va ijtimoiy geosistemalarga* ajratilishi lozim. Pirovardida tabiiy geograflar geografiyaning umumiy obyekti bo`lgan tabiiy hududiy sistemalarni, ijtimoiy geograflar esa hududiy ijtimoiy sistemalarni, ayrim tarmoqlarni (yagona transport sistemasi), jahon xo`jaligini (jahon ishlab chiqarish, savdo, transport, moliyaviy, axborot sistemalari va b.) o`rgana boshladilar.

Geografiya fanlarining har biri tadqiqotning makoniy (hududiy) sistema ko`rinishidagi o`zining moddiy obyektiga ega: relyef sistemasi (geomorfologiya), suv sistemalari (hidrologiya), hayot sistemalari (biogeografiya), tabiiy hududiy va akval komplekslar (tabiiy geografiya), aholi joylashuvi sistemalari, shaharlar sistemalari, iqtisodiy obyektlarning sistemalari va boshqa sistemalar Aholi geografiyasida aholining hududiy sistemalari, shaharlarning sistemalari, murakkab sistema sifatidagi shahar to`g`risidagi tushunchalardan foydalanila boshlandi. Hududiy rekreasion sistema to`g`risidagi tushuncha rekreasiya geografiyasining, hududiy siyosiy sistemalar siyosiy geografiyaning asosiy tushunchalarga aylandi. Bir paytning o`zida kichik sistemalar tabiat elementlarini, turli texnikaviy obyektlarni va texnologik jarayonlarning o`z ichiga oladigan “tabiat – texnika” sistemasi yoki geotexsistema rasmiylashdi. Mamlakatshunoslikda ham sistemali yondashuv qo`llanila boshlandi.

Geografiyada sistemali yondashuv geografik obyektlarni sistema, ya’ni har xil, ammo birlikka ega bo`lgan o`zaro bog`liq elementlardan tashkil topgan hosilalar sifatida tadqiq qilish bo`lib, bu yondashuv geografik sistemalarning (geosistema) alohida sinfi to`g`risidagi tasavvurlarning shakllanishiga, geografik tadqiqotlarga jalb qilinadigan (sotsial sistemalar, “tabiat-texnika”, “tabiat-jamiyat” sistemalari) obyektlar sonini, obyektlar va hodisalarning xossalarini kengayishiga, geografik obyektlarning turli xil modellarini tadqiq qilishda umumiy yondashuvlarni aniqlanishiga imkon berdi. Geografiyada sistemali yondashuv asosida ilgari o`rganilgan tabiiy va ishlab chiqarish komplekskarining bir qator xossalari chuqurroq o`rganila boshlandi[1].

“Geosistema” termini borliqdagi murakkab geografik obyektlarning sistemali sajiyasini ta’kidlash maqsadida kiritiladi. Geosistema geografik qobiqning o`zaro aloqadagi, o`zaro ta’sirdagi bir butun to`plamidan tashkil topgan geografik hosila. Barcha tarkib topgan qoidalarda geosistemaning asosi turli xil elementlarning sistemali xossalarining (bir butunlik, o`zaro aloqa, heterogen elementlar va b.) ifodasidir; qoidalarining ikkinchi qismi geografik sistemalarning belgilariga (sistema va qismlari yoki elementlarining hududiy tartibiyligining munosabatlari; yerga, yer yuzasiga, geografik qobiqqa va b. mansubligi) [7].

Geosistemalarning ularning vertikal tuzilishining yirik doimiy tarkibiy qismlari yoki unga kiradigan geografik qobiqning alohida sferalari (litosfera, hidrosfera va biosfera)ning bo`laklari ularning komponentlari deyiladi. Geosferalarning o`zaro ta’siri va rivojlanishi geosferalarning xossalarini murakkablashtiradi. Shu sababli ularni tahlil qilishda komponentlarning

elementlarga bo'lish zaruriyati vujudga keltiradi. Geosistemalarning elementlari - komponentlarning eng oddiy parchalari bo'lib, ularning kombinasiyalari (bir turdagi bir nechta narsaning o'zaro uyg'un birikmalari) mavjud olam obyektlarining ko'p xilligini yuzaga keladi. Odatda elementlar komponentlarning ayrim xossalarini yoki holatini ifodalaydi.

Hozirgi paytda "geosistema" tushunchalari ta'riflarining bir qancha guruhi tarkib topdi. Bu guruhlar bir-biridan asosan sistema elementlarining tarkibiga bo'lgan ko'rsatmalarning sajiyasi bilan farq qiladi. Tariflarning birinchi guruhida geosistema tabiiy hosila sifatida qaraladi. Geosistema – "bu boshqaruvchi sistemalarning alohida sinfi; tabiatning ayrim komponentlari bir-biri bilan sistemali aloqada bo'ladigan va muayyan bir butunlik sifatida kosmik sfera va kishilik jamiyati bilan o'zaro ta'sirda bo'ladigan barcha kattalikdagi yer makoni"[7]. Geosistemaning bu talqini mazmuniga ko'ra *tabiiy landshaft* tushunchasiga yaqin turadi. Ayrim olimlar "geosistema" termini qo'llash jabhasini faqat elementlari moddalarning bir tomonlama oqimi bilan bog'liq bo'lgan tabiiy sistemalar bilan cheklashni taklif qilishadi. Masalan, daryo havzasi suv oqimi ko'rinishidagi moddiy strukturali - uyushuv markazi bilan birgalikda o'ziga xos geosistema[3,5].

Geosistemaga berilgan ta'riflarning ikkinchi guruhida bir paytning o'zida tabiat, aholi va xo'jalik elementlarini o'z ichiga oladigan murakkab Yer hosilalari, yani Yer yuzasida shakllanadigan har qanday hududiy kompleksni anglatish uchun qo'llanilishi geosistema sifatida qaraladi. Bunday hosilalarning bir butunligi xo'jalik, aholi va tabiat orasidagi to'g'ri, aks va o'zgartirilgan aloqalarga ko'rsatmalar yordamida belgilanadi [6].

Ta'riflarning uchinchi guruhda elementlar tarkibiga cheklanmalar qo'yilmaydi; bu tushuncha Yer yuzasida shakllanadigan har qanday hududiy komplekslar uchun qo'llanilishi mumkin. Termin hududiy: tabiiy, sotsial-iqtisodiy, sotsial-texnikaviy va boshqa sistemalarni belgilash uchun foydalanadi. "Har qanday Yer sistemalari (aktual va potensial), kattaligi genezisiga bog'liq bo'lmagan holda geografik sistemalar sifatida qaralishi mumkin"[2]. Shuningdek, "geosistema" terminini geonomiyaning (bilimlarning Yer to'g'risidagi barcha fanlarni ishg'ol etadigan sohasi) barcha obyektlarini belgilash ham taklif qilinadi [3].

Geosistema geografik qobiqning bir butun ko'plab o'zaro aloqadagi, o'zaro ta'sirdagi komponentlaridan iborat bo'lgan geografik hosila. Berilgan mavjud barcha ta'riflarda geosistema – turli xil elementlarning sistemali (yaxlitlik, o'zaro aloqa) xossalarini ifoda etadi. Shuningdek, bu qoidalar sistemaning geografiyaga mansublik belgilarini (sistema elementlari yoki qismlarning hududiy tartiblashuvining munosabatlari; Yerga, Yer yuzasiga, geografik qobiqqa va boshqa obyektlarga mansubligini) ko'rsatadi.

Geosistema geografik komponentlarning makon-zamondagi sistemasidan iborat bo'lib, bu komponentlar o'zlarining joylashuvida o'zaro taqozada bo'ladi va bir butun sifatda rivojlanadi. Shuningdek, "geosistema" so'zining birinchi qismi sistemaning muhim xossasi sifatidagi hududiylikka ishora qiladi. Chunki, ko'pgina sistemalar (masalan, hayvonlarning organizmlari, murakkab texnik qurilmalar, til sistemalari va b.) hududiylik xususiyatiga ega emas. Geosistemalar esa aniq bir

hududda namoyon bo`ladi va ularning oziga xosligiga maydon, konfigurasiya, tashqi ko`rinish va boshqa hududiy xususiyatlar ta'sir ko`rsatadi.

Har qanday sistema o`ziga nisbatan kichikroq bo`lgan sistemalardan tashkil topgan bo`lib, o`z navbatida uning o`zi ham o`zidan yirikroq sistema tarkibiga kiradi. Sistemani tashkil etuvchi kichik sistemalar *komponentlar* (lot.*komponens* biror narsaning tarkibiy qismi) deyiladi. Kichik sistemalar o`zaro qonuniy munosabatlarda bo`ladi va sistemaning strukturasini hosil qiladi. Sistemalarning komponentlari orasida *elementlar* (lot. *elementum* ilk modda) asosiy kichik sistemalarni ajratish mumkin. Ta`kidlash lozimki, yaxlit sistema uning qismlarining – elementlarining yig`indisidan kattaroqdir. Geosistemaning elementlari komponentlarning eng oddiy zarrachalari bo`lib, ularning uyg`un birikmalaridan (kombinasiyasi) real olam obyektlarining xilma xilligi hosil bo`ladi. Elementlar odatda komponentlarning ayrim xossalarini yoki holatlarini ifodalaydi. Ammo geosistema elementlarning oddiygina tartibsiz yig`indisi emas, balki muayyan strukturaga ega bo`lgan bir butun sifatida rivojlanadigan murakkab moddiy sistema.

Geografiya o`rganadigan barcha sistemalarni geografik sistemalar (geosistemalar) deb atash maqsadga muvofiq. Geografik sistemalar band etgan makonining kattaligiga ko`ra *megasistemaga* (Yer shari yuzasining yoki geografik qobiqning hududi), *makrosistemalarga* (materiklar va ularning ayrim qismlari), *mezosistemalarga* (ayrim mamlakatlarning va mamlakatlar qismlari) va *makrosistemalarga* (ayrim shaharlar va rayonlarning hududlari) ajratiladi [4].

Geosistemani ifodalovchi barcha tushunchalar ikki guruhga bo`linadi. Birinchi guruhga geosistemalarning ichki tuzilishini (“element, komponent”, “aloqa”, “munosabat”, “muhit”, “bir butunlik”, “struktura”, uyushuv (tashkillashuv” va b.) ifodalaydigan tushunchalar mansub. Ikkinchi guruhiga esa geosistemaning faoliyatini (“funksiya”, “barqarorlik”, “muvozanat”, “tartibga solish”, “aks aloqa”, “boshqarish” va b.) ifodalaydigan tushunchalar mansub. Bundan tashqari, geosistemalar ularni shakllantiruvchi jarayonlar (genesis, “evolyusiya” “tarkib topishi” va b.) nuqtai nazaridan ham ifodalanadi.

Geosistemalarda dastavval vertikal (komponentlararo) va gorizontal (sistemalararo) aloqalar farqlanadi. Ular tig`iz o`zaro ta`sirda bo`ladi va bir biriga o`tadi. Ular bir tomonlama, ikki tomonlama, to`g`ri, teskari, ijobiy, nisbiy va boshqa xillarda bo`lishi mumkin. Geosistemalar vertikal tuzilishining yirik doimiy tarkibiy qismlari yoki geografik qobiqning ularga kiradigan ayrim sferalari – litosfera, atmosfera, hidrosfera va biosferaning bo`laklari geosistema komponentlari deyiladi. Geosferalarning o`zaro ta`siri va rivojlanishi ularning xossalarini murakkablashtiradi.

Geosistemalarda aloqalar muhim ahamiyatga ega, chunki ular geosistemaning bir butunligini, uning barqarorligini belgilaydi. Geosistemalardagi aloqalar intensivligi, yo`nalishi va boshqa xususiyatlariga ko`ra tafsiflanishi mumkin. Geosistemalarda dastavval vertikal (komponentlararo) va gorizontal (sistemalararo) aloqalar farqlanadi. Ular tig`iz o`zaro ta`sirda bo`ladi va bir biriga o`tadi. Ular bir tomonlama, ikki tomonlama, to`g`ri, teskari, ijobiy, nisbiy va boshqa xillarda bo`lishi mumkin.

Geosistemalarda oʻzaro aloqalar jarayoni komponentlar va geosistemalar orasidagi modda, energiya va axborotning oddiy yetkazilishigina (oʻtkazilishi) emas. Tashqi omillar yoki oʻz-oʻzidan rivojlanish taʼsiri ostida modda-energiya va axborot oqimlari doimo oʻzgaradi va geosistemalar dastlabki xossalariga ega boʻladi yoki bu xossalarini yoʻqotadi. Geosistemalarning oʻzgarish jarayoni ularning faoliyati, dinamikasi va evolutsiyasi davomida amalga oshadi.

Adabiyotlar roʻyxati

1. Abdullayev S.I., Hasanov K. Geografik sistemalarning xususiyatlari. // “Geografiya – kelajakka nazar” mavzusidagi respublika ilmiy-amaliy konferensiya materiallari toʻplami. Nukus -2024.
2. Гохман В.М. Минц А.А., Преображенский В.С. Системный подход в географии. – В сб. “Вопросы географии, М., 1971, сб.88.
3. Крут И.В. Введение в общую теорию Земли. Москва, Мысл, 1978.4.Охрана ландшафтов. Толковый словарь. Москва, Прогресс, 1982.
5. Ретюм А.Ю., Дьяконов К.Н., Куницын Л.Ф. Взаимодействие техники с природой и геотехнические системы. – “Изв.АН., сер.геогр., 1973, №3.
6. Саушкин Ю.Г., Смирнов А.М. Геосистемы и геоструктуры. “Вестн. МГУ, Сер. Геогр.”, 1958, №5.
7. Сочава В.Б. Определение некоторых понятий и терминов физической географии. Докл.инс. геогр. Сибири и Дальнего Востока. 1963. №3.
8. Omonullayev O. H. Qashqadaryo viloyatida erkin iqtisodiy zonalar faoliyatini takomillashtirishning hududiy jihatlari//Экономика и социум. – 2025. – №. 6-2 (133). – С. 653-658.

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**HUDUDLARNING INVESTITSION SIYOSATINI
TAKOMILLASHTIRISH ZARURATI VA USTUVOR YO‘NALISHLARI
(JIZZAX VILOYATI MISOLIDA)**

Annotatsiya: Mazkur maqolada hududlarning investitsion siyosatini takomillashtirish zarurati, investitsion muhitni yaxshilashning iqtisodiy ahamiyati hamda hududiy rivojlanishni ta’minlashdagi ustuvor yo‘nalishlar yoritilgan. Shuningdek, hududlarga investitsiyalarni jalb etish mexanizmlarini rivojlantirish, davlat va xususiy sektor hamkorligini kuchaytirish hamda investitsion faollikni oshirish bo‘yicha taklif va tavsiyalar ishlab chiqilgan.

Kalit so‘zlar: hududiy rivojlanish, investitsion siyosat, investitsion muhit, xorijiy investitsiyalar, iqtisodiy o‘shish, davlat-xususiy sheriklik.

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**THE NEED AND PRIORITY DIRECTIONS OF IMPROVING THE
INVESTMENT POLICY OF THE REGIONS
(in the example of Jizzakh region)**

Abstract: This article describes the need to improve the investment policy of the regions, the economic importance of improving the investment environment, and the priority directions for ensuring regional development. Proposals and recommendations were also developed for the development of mechanisms for attracting investments to the regions, strengthening the cooperation of the public and private sectors, and increasing investment activity.

Key words: regional development, investment policy, investment climate, foreign investments, economic growth, public-private partnership.

Kirish

Bugungi global iqtisodiy sharoitda hududlarning barqaror va izchil rivojlanishi ularning investitsion salohiyatini oshirish bilan chambarchas bog‘liq. Investitsiyalar iqtisodiy o‘shish, ishlab chiqarish va xizmatlar tarmog‘ini

kengaytirish, yangi ish o‘rinlarini yaratish, hamda aholi farovonligini oshirishga xizmat qiluvchi asosiy omillardan biridir. Ayniqsa, viloyatlar kesimida investitsion siyosatni takomillashtirish strategik ustuvor yo‘nalishga aylanmoqda, chunki har bir hudud o‘zining resurs salohiyati, geografik joylashuvi va ijtimoiy-iqtisodiy xususiyatlariga ega.

Mazkur maqolada Jizzax viloyati misolida hudud investitsiyalarining holati, uning afzalliklari va mavjud muammolari, shuningdek, investitsion siyosatni takomillashtirishning ustuvor yo‘nalishlari tahlil qilinadi.

1. Jizzax viloyatida investitsiyalar hajmi va statistik ko‘rsatkichlar

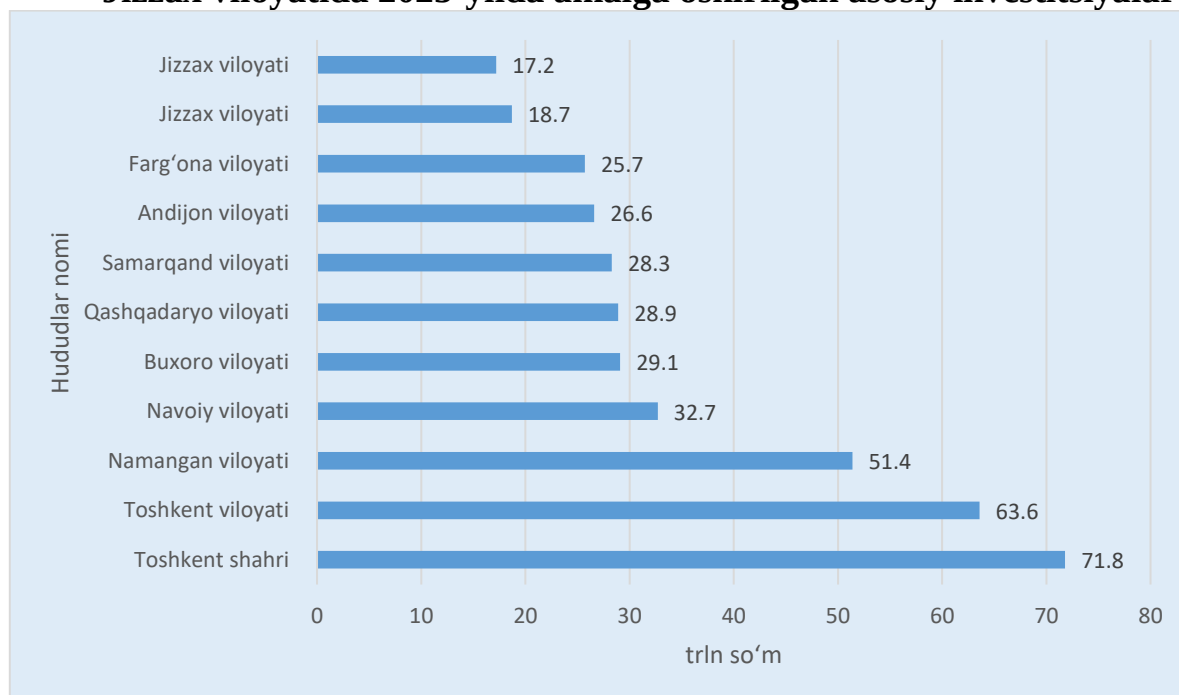
Jizzax viloyati so‘nggi yillarda investitsiyalarni jalb etish bo‘yicha ijobiy tendentsiyalarni namoyish etmoqda. 2025-yilning yanvar–sentabr holatiga ko‘ra, hududlar kesimida 443,6 trillion so‘mlik asosiy kapitalga investitsiyalar o‘zlashtirilgan bo‘lib, Jizzax viloyati 18,7 trillion so‘m miqdor bilan umumiy hajmning taxminan 4,2 % ini tashkil etgan. Bu ko‘rsatkichlar viloyatning mamlakat bo‘yicha investitsiya strukturasiidagi rolini ochiq ko‘rsatadi.

2023-yilda markazlashgan investitsiyalar hajmi Jizzaxda 1,8 trln so‘mga yetdi, bu investitsiyalarning o‘rishini aks ettiradi.

Bundan tashqari so‘nggi yillarda investitsiyalarni jalb etish bo‘yicha yirik loyihalar amalga oshirilmoqda. 2024-yilda viloyatda 400 ta loyiha bo‘yicha umumiy qiymati 2 mlrd AQSh dollari miqdorida investitsiya jalb qilindi va bu loyihalar 11 000 dan ortiq yangi ish o‘rinlarini yaratish rejalashtirilgan. Shuningdek, yana 50 loyiha bo‘yicha qariyb 6,1 mlrd AQSh dollari qiymatida investitsiyalar jalb etilishi ko‘zda tutilgan.

Grafik 1.²

Jizzax viloyatida 2025-yilda amalga oshirilgan asosiy investitsiyalar



² https://stat.uz/uz/matbuot-markazi/qo-mita-yangiliklar/64902-investitsiyalar-b-jicha-ajsi-ududlar-etakchi-2?utm_source

Milliy statistika qo‘mitasi ma’lumotlariga ko‘ra, 2025-yilning yanvar—sentabr oylarida 443,6 trln so‘mlik asosiy kapitalga investitsiyalar o‘zlashtirilgan.

2. Investitsiya tarkibi va istiqbollari

Investitsiyalarning tarkibiy tahliliga qaraganda, investitsiyalar ko‘pincha infratuzilma va yangi qurilish loyihalariga yo‘naltirilmoqda. Masalan, ilgari (2022-yilda) investitsiyalarning 50,3 % i yangi qurilishlar uchun ajratilgan.

Viloyatga jalb etilgan xorijiy investitsiyalar ham muhim rol o‘ynaydi — 2022-yilda xorijiy to‘g‘ridan-to‘g‘ri investitsiyalar umumiy hajmning 95,2 % ini tashkil etgan.

Aholi soni va iqtisodiy ko‘rsatkichlar bo‘yicha Jizzaxda doimiy aholi soni 2025-yil 1- oktabr holatiga 1 559 883 nafarni tashkil etgan, bu hudud iqtisodiy faollikni yanada kengaytirish uchun katta inson resursiga ega ekanini ko‘rsatadi.

3. Investitsion siyosatni takomillashtirish zarurati

Hududning iqtisodiy potensialini to‘liq ochish uchun investitsion siyosat samaradorligini oshirish zarur. Buning bir nechta asosiy sabablari mavjud:

- **Infratuzilma salohiyati:** Transport, energetika, kommunikatsiya kabi infratuzilmalar hali ham investitsiya talab qilmoqda — bu esa investorlar uchun qo‘shimcha imkoniyatlar yaratadi.

- **Raqobat bardoshligi:** Hududlar o‘rtasida iqtisodiy farqlar mavjud bo‘lib, ularni kamaytirish investitsiyalarni jalb etish orqali amalga oshiriladi.

- **Bandlik va eksport imkoniyatlari:** Investitsiyalar yangi sanoat korxonalarini yaratishda muhim rol o‘ynaydi va eksport salohiyatini oshiradi.

Jizzax misolida bu talablar aniq ko‘rinmoqda, chunki viloyat hukumatining maqsadi 2025 yilgacha 2 mlrd AQSh dollari investitsiya jalb etish fikrini ilgari surmoqda.

4. Ustuvor yo‘nalishlar

Hududning investitsion siyosatini takomillashtirishda quyidagi yo‘nalishlarga alohida e’tibor qaratish zarur:

a) Infratuzilma sarmoyalari va raqobatbardoshlik

Investitsiyalarni yo‘naltirishda infratuzilma taraqqiyoti ustuvor bo‘lishi lozim — avtomobil yo‘llari, logistika markazlari, energiya tarmoqlari bu jarayonda strategik ahamiyatga ega.

b) Davlat-xususiy sheriklik

Davlat va xususiy sektorning sheriklik asosida hamkorligi investitsion loyihalarni amalga oshirish va moliyaviy resurslarni jalb etishda muhim rol o‘ynaydi.

c) Xorijiy investitsiyalarni qo‘llab-quvvatlash

Xorijiy investitsiyalar viloyatga salohiyatli texnologiyalar va tajriba olib kiradi. Ularni jalb etish uchun qulay iqlim yaratish — soliqlar, kafolatlar va huquqiy kafolatlar — investitsion siyosatning ustuvor yo‘nalishi bo‘lishi kerak.

d) Mahalliy salohiyatni rivojlantirish

Mahalliy biznes va kichik korxonalarni qo‘llab-quvvatlash orqali viloyat iqtisodiyotini diversifikatsiya qilish mumkin.

TAKLIF VA TAVSIYALAR

1. **Investitsion infratuzilmani modernizatsiya qilish** – transport, logistika va energetika tarmoqlariga sarmoya jalb qilish.

2. **Xorijiy investorlarni qo‘llab-quvvatlash** – soliq imtiyozlari, huquqiy kafolatlarni kuchaytirish.

3. **Davlat-xususiy sheriklik mexanizmlari** – katta loyihalarni moliyalashtirish uchun sheriklik shartnomalarini kengaytirish.

4. **Mahalliy biznesni rivojlantirish** – kichik va o‘rta biznes uchun kredit va grant dasturlarini joriy etish.

Xulosa

Jizzax viloyati so‘nggi yillarda investitsiyalarni jalb etish bo‘yicha sezilarli ijobiy natijalarga erishmoqda. Statistik ma’lumotlar shuni ko‘rsatadiki, hududga yirik loyihalar, yangi ish o‘rinlari va iqtisodiy faollikni oshirish uchun investitsiyalar yo‘naltirilmoqda. Biroq, hududlar o‘rtasidagi iqtisodiy farqlarni bartaraf etish, infratuzilma rivojlanishini tezlashtirish, xorijiy va mahalliy sarmoyalarni jalb etish kabi masalalar investitsion siyosatning takomillashtirilishini talab etadi.

Ushbu jarayon hududning raqobatbardoshligini oshiradi va investitsion muhitni yanada jozibador qiladi — bu esa uzoq muddatli iqtisodiy o‘sish va ijtimoiy farovonlikni ta’minlashga xizmat qiladi.

FOYDALANILGAN ADABIYOTLAR RO‘YXATI

1. Zaynalov, J. R., Aliyeva, S. S., & Ruzibayeva, N. X. (2020). Investitsiya. Toshkent: Iqtisod-Moliya nashriyoti.
2. Haydarov, O‘. A. (2022). Investitsiya. Toshkent: Yangi nashr nashriyoti.
3. O‘zbekiston Respublikasi. (2019-yil 25-dekabr). Investitsiyalar va investitsiya faoliyati to‘g‘risida (O‘RQ-598-son).

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PEDAGOGICAL SIGNIFICANCE OF ENVIRONMENTAL VALUES IN ENSURING CONTINUITY OF EDUCATION AND UPBRINGING

Annotation: *The integration of environmental values into the education system plays a crucial role in ensuring the continuity of education and upbringing. In the context of global environmental challenges, education is no longer limited to knowledge transfer but also serves as a key mechanism for shaping values, attitudes, and responsible behavior toward nature and society. This article examines the pedagogical significance of environmental values in maintaining the unity and continuity of education and upbringing. It analyzes theoretical approaches, pedagogical principles, and practical strategies for embedding environmental values into educational processes at different levels. The study highlights the role of environmental education in fostering sustainable development, moral responsibility, and ecological culture among learners.*

Keywords: *Environmental values, continuity of education, upbringing, ecological culture, sustainable development, environmental education, pedagogical approach.*

In the modern era, humanity faces unprecedented environmental challenges, including climate change, biodiversity loss, pollution, and the depletion of natural resources. These global problems necessitate not only technological and economic solutions but also profound changes in human consciousness and behavior. Education, as a fundamental social institution, plays a decisive role in addressing these challenges by shaping environmentally responsible individuals. In this context, environmental values become a core component of education and upbringing, ensuring their continuity and coherence.

The concept of continuity in education and upbringing implies a systematic, consistent, and interconnected process that integrates cognitive, moral, and behavioral dimensions of personality development. Environmental values serve as a unifying element that connects knowledge acquisition with ethical attitudes and practical actions. Therefore, understanding the pedagogical significance of environmental values is essential for designing effective educational systems oriented toward sustainable development.

This article aims to explore the role of environmental values in ensuring the continuity of education and upbringing, identify their pedagogical foundations, and analyze effective methods for their integration into educational practice.

The pedagogical significance of environmental values has been widely discussed in educational and environmental studies. Scholars emphasize that environmental education should go beyond the transmission of ecological knowledge and focus on value formation, ethical responsibility, and active citizenship. According to contemporary pedagogical theories, values act as mediators between knowledge and behavior, guiding individuals' decisions and actions.

Researchers argue that the continuity of education and upbringing can be achieved when environmental values are systematically embedded across all levels of education, from early childhood to higher education. Studies highlight the importance of interdisciplinary approaches, learner-centered pedagogy, and experiential learning in fostering environmental awareness and responsibility. Furthermore, the integration of environmental values is closely linked to the development of ecological culture, which reflects an individual's holistic relationship with nature and society.

The pedagogical significance of environmental values in ensuring the continuity (преемственность) of education and upbringing lies in their unique capacity to create a coherent, lifelong thread that connects cognitive development, moral formation, emotional growth, and practical responsibility toward nature across all stages of human life. Environmental values—such as respect for living systems, sustainability, ecological responsibility, harmony between humans and nature, and intergenerational equity—serve as foundational orienting principles that transform isolated learning episodes into a unified, progressive process of personality development.

Core Role of Environmental Values as a Unifying Pedagogical Factor

Environmental values function pedagogically as an integrative axis that bridges formal education (school curricula), informal learning (family, community, media), and non-formal upbringing (personal experiences, habits, ethical norms). They ensure continuity by:

- Establishing early emotional-affective foundations during preschool and early childhood, where direct contact with nature fosters wonder, empathy, love for the natural world (biophilia), and initial moral attitudes. Without this early emotional bond, later rational knowledge often remains abstract and fails to translate into behavior.

- Providing progressive deepening of knowledge and skills from primary to secondary and higher education, where scientific understanding of ecosystems, biodiversity, climate dynamics, and human impacts builds systematically on prior stages.

- Extending into adulthood and lifelong learning, where these values manifest in professional ethics, civic participation, sustainable consumption, and family transmission of responsible behaviors.

This creates a spiral of development: early experiences shape attitudes → attitudes guide knowledge acquisition → knowledge reinforces responsible actions → actions strengthen values → values motivate further learning. Disruption at any stage weakens the entire chain, leading to fragmented environmental awareness or "knowledge without action."

Principles Supporting Continuity Through Environmental Values

Several key pedagogical principles, drawn from established frameworks in environmental education, highlight how these values secure uninterrupted progression:

Principle of Continuity and Preemstvennost (Преемственность) — The most critical for ensuring seamless transitions. It demands that each educational stage maximally utilizes achievements from previous ones while preparing for the next. Environmental values provide the constant "red thread": a child who learns to care for plants in kindergarten carries this ethic into school projects on conservation, then into adult decisions on resource use. This principle resolves contradictions between personal knowledge levels and societal needs by requiring ongoing knowledge renewal throughout life.

Principle of Lifelong (Непрерывного) Environmental Education — Environmental values demand involvement "from cradle to grave." Preschool lays emotional foundations; school develops scientific literacy and critical thinking; higher education and adult learning apply values to professional and civic contexts. UNESCO and related frameworks emphasize that only continuous exposure prevents loss of early-formed attitudes and enables adaptation to evolving ecological challenges.

Integration of Education and Upbringing (Обучение и Воспитание) — Environmental values inherently merge cognitive (knowledge about ecosystems) with axiological (value-based attitudes) and behavioral (practical actions) domains. This holistic approach prevents education from becoming purely informational while upbringing remains merely emotional. The result is a personality with ecological responsibility as a core trait, not an add-on.

Humanization and Value-Orientation — These values humanize pedagogy by shifting focus from anthropocentric dominance over nature to harmonious coexistence. They cultivate ethical norms, aesthetic appreciation, and moral responsibility, making upbringing more profound and education more meaningful.

Stages of Continuity Enabled by Environmental Values

- **Preschool and Early Childhood** — Emphasis on sensory-emotional experiences (wonder, joy in nature, empathy for living things). Values form the base: love precedes knowledge. Positive early bonds predict lifelong pro-environmental behavior.

- **Primary and Secondary School** — Systematic knowledge building (ecosystems, sustainability principles) combined with value reinforcement through projects, problem-solving, and ethical discussions. Continuity appears in curriculum progression and habit formation (e.g., waste reduction, nature observation).

- Higher Education and Professional Training — Application of values in specialized contexts (environmental management, policy, engineering). Values ensure ethical decision-making amid technical expertise.

- Adult Lifelong Learning and Family Upbringing — Values manifest in daily practices, community involvement, and intergenerational transmission. Educated adults model behaviors for children, closing the loop and ensuring societal reproduction of ecological culture.

Outcomes and Pedagogical Impact

When environmental values anchor continuity:

- Individuals develop as ecologically responsible personalities — capable of critical thinking about human-nature relations, making informed decisions, and acting sustainably.

- Education becomes transformative rather than transmissive, addressing global crises while fostering personal growth.

- Upbringing gains depth, as values like intergenerational justice and respect for all life forms shape moral character beyond narrow self-interest.

- Society benefits from cumulative effects: generations progressively more attuned to sustainability needs.

In essence, environmental values are not peripheral to pedagogy; they are a strategic mechanism for making education and upbringing truly continuous, purposeful, and future-oriented. Their absence fragments development, while their systematic integration creates resilient, ethically grounded individuals ready to sustain both human well-being and planetary health. This pedagogical function remains especially vital in addressing contemporary ecological challenges, where short-term thinking must yield to lifelong, value-driven responsibility.

The findings suggest that environmental values are not supplementary but central to the educational process. Their pedagogical significance lies in their ability to unify educational content with upbringing objectives, ensuring the holistic development of learners. The continuity of education and upbringing is strengthened when environmental values are consistently reinforced through curriculum design, teaching methods, and institutional culture.

Conclusion

In conclusion, environmental values play a fundamental pedagogical role in ensuring the continuity of education and upbringing. They bridge the gap between knowledge, values, and behavior, fostering ecological culture and sustainable thinking. To enhance their impact, the following recommendations are proposed:

Integrate environmental values systematically across all educational levels and disciplines;

Employ learner-centered and experiential teaching methods;

Promote teacher training focused on value-based environmental education;

Encourage collaboration between educational institutions and local communities.

References:

1. Abdurahmanov, S. (2018). Interfaol ta'lim metodlari va ularning ta'lim jarayoniga ta'siri. *O'zbekiston Respublikasi ta'lim tizimi*.
2. Abduraxmanov, S. T. (2025, October). Ekologik ta'lim-integratsiyalashgan yondoshuv; muammo, taxlil va maqsadlar. *In Partner conferences of the International Scientific Journal Research Focus* (Vol. 1, No. 1, pp. 42-44).
3. Abdurakhmanov, S., Dehqonboyeva, Z., & Urmanova, S. (2025, November). Geocological Characteristics Of Namangan Region Under Climate Change Conditions. *In International Conference on Global Trends and Innovations in Multidisciplinary Research* (Vol. 1, No. 5, pp. 31-35).
4. Baxtiyor o'g'li, R. I. (2025, October). Ta'lim jarayonida ekologik startap va tashabbuslarni qo'llab-quvvatlash. *In Partner conferences of the International Scientific Journal Research Focus* (Vol. 1, No. 1, pp. 209-212).
5. Baxtiyor ogli, R. I. (2025, October). Yoshlarning ekologik savodxonligini oshirishda axborot-kommunikatsiya texnologiyalaridan foydalanish. *In Partner conferences of the International Scientific Journal Research Focus* (Vol. 1, No. 1, pp. 77-80).
6. Baxtiyor ogli, R. I. (2025, October). Steam yondashuvi asosida ekologik ta'limni tashkil etish. *In Partner conferences of the International Scientific Journal Research Focus* (Vol. 1, No. 1, pp. 57-61).
7. Baxtiyor ogli, R. I. (2025, October). Dars jarayonida "yashil texnologiyalar" ni o'rgatish tajribasi. *In Partner conferences of the International Scientific Journal Research Focus* (Vol. 1, No. 1, pp. 68-71).
8. Ergasheva, T. (2022). Maktabgacha ta'lim muassasalarida qiziqarli o'yinlar yordamida ekologik ta'lim samaradorligini oshirish imkoniyatlari. *Экономика и социум*, (5-2 (92)), 84-87.
9. Mirzohid, Q., & Muhlisa, U. (2021). Maktabgacha ta'lim muassasalari tarbiyalanuvchilariga ekologik ta'lim va tarbiyani kuchaytirishning zarurati xususida. Iqtidorli talabalar ilmiy axborotnomasi. *Iqtidorli talabalar ilmiy axborotnomasi*.
10. Maxammadoli o'g, M.M.X. (2025). Yosh regbichilarning maxsus harakat ko'nikmalarini shakllantirish metodikasi. *Shokh Articles Library*, 1(2).
11. Mo'minov, M. (2022). Yoshlarni vatanparvarlik ruhida tarbiyalash masalalari. *Oriental Art and Culture*, 3(2), 734-740.
12. Rustamjonovich, Q.M. at all. (2023). Maktabgacha ta'lim muassasalari tarbiyalanuvchilarining ekologik savodxonligini oshirishda jonli tabiat burchaklarining o'rni. *Research Focus*, 2(1), 487-490.
13. Turdialievich, A. S., & Mansurjonovna, S. M. (2025, October). Atrof-muhitni asrashning hududiy va mintaqaviy hususiyatlari. *In Partner conferences of the International Scientific Journal Research Focus* (Vol. 1, No. 1, pp. 111-113).

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MODERN DIRECTIONS FOR MODERNIZING GEOGRAPHY EDUCATION BASED ON FOREIGN COUNTRIES' EXPERIENCE (ON THE EXAMPLE OF HIGHER EDUCATION INSTITUTIONS)

Annotation: *The rapid globalization of education and the transformative impact of digital technologies have prompted higher education institutions worldwide to rethink and modernize geography education. This article analyzes current international practices in modernizing geography curricula, teaching methodologies, and technological integration with the goal of identifying effective directions that can inform higher education reforms in other contexts. Drawing upon comparative literature and international case studies from Europe, North America, and Asia, we explore key trends such as competency-based learning, Geographic Information Systems (GIS) integration, experiential and project-based learning, digital fieldwork, and interdisciplinary approaches. The results highlight the importance of a learner-centered paradigm, flexible curriculum design, and meaningful use of technology for spatial thinking development. Based on this analysis, the article proposes actionable strategies for improving geography education in higher education institutions, contributing to the advancement of geography teaching in diverse educational environments.*

Keywords: *Geography education, modernization, higher education, international experience, digital learning, GIS, competency-based curriculum, pedagogical innovation.*

In the 21st century, geography education faces unprecedented opportunities and challenges due to social, environmental, and technological changes. Geography—by its nature—bridges natural systems and human processes, requiring curricula that equip students with analytical skills, spatial reasoning, and adaptability to complex global issues. Higher education institutions are pivotal in shaping future geographers, planners, environmental managers, and educators who can address sustainability challenges. Therefore, modernizing geography education has become a priority globally.

Modernization in this context implies reorienting pedagogy toward student-centered learning, incorporating digital tools such as GIS and remote sensing,

fostering interdisciplinary perspectives, and aligning educational outcomes with societal needs, including the Sustainable Development Goals (SDGs). The aim of this article is to identify and analyze innovative approaches from different countries that have successfully modernized geography education at the higher education level and to extract lessons applicable across educational systems.

Geography education at the higher education level has evolved significantly in recent decades, influenced by global challenges such as climate change, rapid urbanization, digital transformation, geopolitical shifts, and the need for sustainable development. Drawing from international experiences—primarily from Europe, the United States, Asia, Latin America, and global networks like the International Geographical Union (IGU)—modernization efforts focus on making curricula more relevant, interdisciplinary, technology-integrated, and oriented toward developing critical geographical thinking and employability skills. These directions emphasize shifting from rote memorization of facts to inquiry-based, problem-solving approaches that prepare graduates for complex real-world issues.

Core Modern Directions in Geography Higher Education

Deep Integration of Geospatial Technologies (GST) and Digital Tools

One of the most prominent trends worldwide is the incorporation of Geographic Information Systems (GIS), remote sensing (RS), Global Positioning Systems (GPS), big data, artificial intelligence (AI), and virtual/augmented reality (VR/AR) into curricula. These tools enable students to analyze spatial patterns, visualize data, and address real-time environmental and social problems.

In the United States, the Association of American Geographers (AAG) reports growing emphasis on GIScience and cartography programs, with these fields comprising a larger share of master's degrees. GIS is used to foster spatial thinking, support interdisciplinary applications (e.g., in public health, natural resources, and computer science), and enhance employability. Community colleges and undergraduate programs increasingly offer GIS-focused tracks to meet demand in high-growth sectors.

In Europe and Asia, systematic reviews of teaching with GIS (2010–2024) highlight its role in promoting geospatial inquiry—asking geographic questions, collecting spatial data, analyzing patterns, and drawing conclusions. Countries like those in Peninsular Southeast Asia integrate smartphone-based GIS for community mapping and fieldwork, while European institutions use GIS alongside RS for environmental monitoring and sustainable development education. Emerging technologies like big data processing (via Python, R, or ArcGIS/QGIS) and AI are gaining traction to handle large datasets for climate and urban studies. VR/AR provides immersive experiences as alternatives or supplements to traditional fieldwork, particularly in resource-constrained settings.

Development of Geographical Thinking and Inquiry-Based Pedagogies

A key international priority is cultivating "geographical thinking"—the ability to understand spatial relationships, scale, place, human-environment interactions, and change over time. This goes beyond descriptive knowledge to foster critical analysis, evidence-based reasoning, and ethical decision-making.

The International Geographical Union's Commission on Geographical Education (IGU-CGE) promotes this through declarations and charters (e.g., the 2016 International Charter on Geographical Education), which stress geography's role in building responsible global citizens amid rapid change and risk. Research shows increasing scholarly interest in geographical thinking, with publications rising over the past two decades, emphasizing transformative pedagogies that address diversity, equity, and sustainability.

In Europe, projects like HERODOT and TUNING have defined subject-specific competences for geography programs aligned with the Bologna Process. These include interpreting landscapes, applying interdisciplinary knowledge, conducting spatial analysis, and committing to ethical and sustainable practices. Competences distinguish foundational skills at the undergraduate level from advanced research and specialization at postgraduate levels. Inquiry-based learning, often linked to geospatial tools, encourages students to tackle local-to-global issues through projects, case studies, and collaborative research.

Internationalization, Collaboration, and Curriculum Harmonization

Cross-border partnerships and virtual mobility have become central to modernization, reducing geographic and financial barriers while promoting shared knowledge and diverse perspectives.

The IGU-CGE facilitates global dialogue through conferences, symposia, and publications like the International Research in Geographical and Environmental Education journal. Initiatives focus on comparative studies, teacher training, and addressing geographical illiteracy worldwide. Recent conferences (e.g., in South Africa and Ireland) emphasize transformative pedagogies, technology integration, and sustainable practices across educational levels.

In Europe, the Bologna-aligned TUNING project and HERODOT network have led to competence-based frameworks, encouraging flexible curricula with global perspectives, employability focus, and lifelong learning. Virtual exchanges, joint projects, and webinars allow students to collaborate internationally without physical mobility.

Broader trends include South-South cooperation and decolonizing approaches, though challenges remain in balancing Global North dominance with equitable partnerships.

Interdisciplinary and Transformative Approaches

Geography is positioned as a bridge discipline linking natural sciences, social sciences, policy, and technology. Curricula increasingly incorporate sustainability, climate resilience, and social justice themes.

Transformative learning—emphasizing personal and societal change—appears in projects like Germany's KlimaTrafo, which uses podcasts, exhibitions, and student-led initiatives for environmental education. In Asia and Latin America, trends include integrating GST with problem-solving and environmental awareness, often through open-access journals and regional networks.

Student-centered models prioritize active learning, fieldwork (real or virtual), citizen science, and real-world applications to prepare graduates for careers in policy, planning, conservation, and data analysis.

Regional Examples and Comparative Insights

Europe — Strong focus on Bologna harmonization, competence frameworks (TUNING/HERODOT), GIS/RS integration, and internationalization via virtual tools. Emphasis on employability and ethical competences.

United States — Growth in GIScience degrees, interdisciplinary embedding (e.g., in environmental science and IT), and community college programs to broaden access.

Asia and Latin America — Increasing use of mobile GIS for local problem-solving, emphasis on sustainable development, and regional collaborations to overcome resource disparities.

Global (IGU-CGE) — Priorities include research on learning progressions, misconceptions, teacher education, and equitable international partnerships.

Persistent Challenges

Modernization faces hurdles such as uneven access to technology (e.g., digital divides in developing regions), slow curriculum adaptation, underfunding of geography research, and tensions between broad interdisciplinary exposure and disciplinary depth. Post-pandemic shifts have accelerated online and hybrid models but highlighted inequalities in virtual access.

Recommendations for Higher Education Institutions

To align with international best practices, institutions should:

Embed GST deeply into core curricula, with training in tools like GIS, Python, and AI for spatial analysis.

Adopt competence-based designs inspired by TUNING, focusing on geographical thinking, inquiry, and employability.

Pursue international collaborations through IGU networks for joint projects, virtual mobility, and comparative research.

Promote transformative, student-centered pedagogies that link local issues to global challenges, incorporating sustainability and ethics.

Invest in teacher training and open resources to ensure equitable implementation.

These directions, informed by diverse foreign experiences, position geography education to produce adaptable, spatially literate graduates capable of addressing 21st-century complexities.

Conclusions

Modernizing geography education in higher education institutions is a multifaceted endeavor requiring curriculum reform, pedagogical innovation, and technological integration. The comparative analysis shows that countries leading these reforms focus on competency development, experiential learning, digital tools, and interdisciplinary approaches. These directions collectively enhance students' spatial literacy, analytical capabilities, and readiness for complex professional environments.

Based on international practices, the following recommendations are proposed for higher education institutions seeking to modernize geography education:

Develop Competency-Based Curricula: Align learning outcomes with disciplinary competencies and real-world applications.

Institutionalize GIS Education: Ensure geospatial technologies are integrated throughout the program, not isolated in elective courses.

Strengthen Experiential Learning: Expand fieldwork programs and embed community-engaged projects.

Invest in Digital Infrastructure: Adopt virtual learning environments and digital fieldwork tools to complement traditional experiences.

Promote Faculty Development: Provide professional development for instructors in modern pedagogies and technologies.

Foster Interdisciplinary Collaboration: Create joint modules with related departments (e.g., environmental sciences, data science).

If implemented thoughtfully, these directions can advance geography education to meet the demands of a rapidly changing world and prepare graduates to address complex socio-environmental challenges.

References.

1. Abdurahmanov, S. (2018). Interfaol ta'lim metodlari va ularning ta'lim jarayoniga ta'siri. *O'zbekiston Respublikasi ta'lim tizimi*.
2. Abdurahmanov, S., & Boltaboev, F. (2025, October). Geografiya ta'limida axborot texnologiyalaridan foydalanishning bugungi kun ahamiyati va dolzarbligi. *In Partner conferences of the International Scientific Journal Research Focus* (Vol. 1, No. 1, pp. 54-56).
3. Abduraxmanov, S.T., & Dehqonboyeva, Z.B. (2025, October). Global iqlim o'zgarishi mavzusini o'qitishda muammoli ta'lim uslubining o'rni. *In Partner conferences of the International Scientific Journal Research Focus* (Vol. 1, No. 1, pp. 24-26).
4. Baxtiyor o'g'li, R. I. (2025, October). Ta'lim jarayonida ekologik startap va tashabbuslarni qo'llab-quvvatlash. *In Partner conferences of the International Scientific Journal Research Focus* (Vol. 1, No. 1, pp. 209-212).
5. Baxtiyor ogli, R.I. Talim jarayonida elektron resurslar salmog'ini oshirish bo'yicha samarali strategiya ishlab chiqish. *Namangan davlat pedagogika instituti*
6. Ergasheva, T. (2022). Maktabgacha ta'lim muassasalarida qiziqarli o'yinlar yordamida ekologik ta'lim samaradorligini oshirish imkoniyatlari. *Экономика и социум*, (5-2 (92)), 84-87.
7. Gaypova, R.T., Abdurahmanov, S.T., & Sapaeva, M.M. (2025, December). Geografiya fanlarini o'qitishda foydalaniladigan xorijiy tajribalar. *In Conferences* (Vol. 1, No. 6, pp. 431-436).
8. Ikhtiyor, R. (2024). Using the Kahoot Education Platform to Create E-Learning Resources in Geography Education. *Journal of New Century Innovations*, 67(4), 19-23.

9. Mirzohid, Q., & Muhlisa, U. (2021). Maktabgacha ta'lim muassasalari tarbiyalanuvchilariga ekologik ta'lim va tarbiyani kuchaytirishning zarurati xususida. Iqtidorli talabalar ilmiy axborotnomasi. *Iqtidorli talabalar ilmiy axborotnomasi*.
10. Maxammadsoli o'g, M.M.X. (2025). Yosh regbichilarning maxsus harakat ko'nikmalarini shakllantirish metodikasi. *Shokh Articles Library*, 1(2).
11. Mirzamaxmudovich B., Turdaliyev I., Ixtiyor R. Geografiya ta'limida interaktiv kartografik qo'llanmalarining ahamiyati va samaradorligi: talaba va o'qituvchilarning tajribasi asosida tahlil // *Research and publications*. – 2025. – T. 11. – №. 1. – C. 68-75.
12. Mo'minov, M. (2022). Yoshlarni vatanparvarlik ruhida tarbiyalash masalalari. *Oriental Art and Culture*, 3(2), 734-740.
13. Ro'za, G., Turdialievich, A.S., & Mansurjonovna, S.M. (2025, October). Geografiya fanlarini o'qitishda foydalaniladigan xorijiy tajribalar. In *Partner conferences of the International Scientific Journal Research Focus* (Vol. 1, No. 1, pp. 201-205).
14. Rustamjonovich, Q.M. at all. (2023). Maktabgacha ta'lim muassasalari tarbiyalanuvchilarining ekologik savodxonligini oshirishda jonli tabiat burchaklarining o'rni. *Research Focus*, 2(1), 487-490.

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**ФАВҚУЛОДДА ВАЗИЯТЛАР ПРОФИЛАКТИКАСИНИ
РАҚАМЛАШТИРИШНИНГ МОНИТОРИНГИ ВА
ПРОГНОЗЛАШДАГИ МОҲИЯТИ**

***Annotatsiya.** Ushbu maqolada respublikamiz hududidagi iqlim o'zgarishi va ob havoning keskin isib ketishi davrida aholi yashash xonadonlarida yuzaga keladigan texnogen tisdagi favqulodda vaziyatlar (yong'inlar) tahlil qilinib, aynan shu davrda respublikamiz hududida sodir bo'lishi mumkin bo'lgan yong'inlarni oldini olish yuzasidan hozirda amalga oshirilayotgan profilaktik tadbirlar holati yoritilgan. .*

Shuningdek, xalqaro tajribalarni mahalliy sharoitlarga moslashtirish orqali tadbirlarni raqamlashtirish yuzasidan yagona platforma yaratish va uni tegishli xizmatlar bilan integratsiya qilish taklif etilgan.

***Kalit so'zlar:** favqulodda vaziyatlar, yong'inlar, aholi xavfsizligi, xalqaro tajriba, profilaktika choralari, yagona platforma, monitoring va prognoz, hamkorlikdagi xizmatlar.*

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**ESSENCE OF DIGITALIZATION IN MONITORING AND
FORECASTING EMERGENCY PREVENTION**

***Abstract.** This article analyzes man-made emergencies (fires) that occur in residential buildings during climate change and sharp warming in our republic, and highlights the current state of preventive measures being taken to prevent fires that may occur in our republic during this period. .*

It is also proposed to create a single platform for digitizing events by adapting international experiences to local conditions and integrating it with relevant services.

Keywords: *emergencies, fires, public safety, international experience, preventive measures, single platform, monitoring and forecasting, collaborative services.*

Kirish. Bugungi kunda iqlim o'zgarishi davrimizning asosiy muammosi bo'lib, uning yechimi tarixning burilish nuqtasi bo'lishi mumkin. Mamlakatlarning asosiy qismi global isish ta'sirida qolib aziyat chekmoqda.

Mustaqillik yillarida mamlakatda aholini va hududlarni tabiiy hamda texnogen xususiyatli favqulodda vaziyatlardan muhofaza qilish bo'yicha samarali chora-tadbirlar amalga oshirildi. Yong'inlarga qarshi kurashish kompleks tizimi shakllantirilib, bu yo'nalishlarda, jumladan, yong'in va avariya-qutqaruv texnikasi va jihozlarining mahalliy turlari ishlab chiqarilishini rivojlantirish orqali moddiy-texnik baza bosqichma-bosqich mustahkamlanmoqda. Shu bilan birga, favqulodda vaziyatlarning oldini olish va bartaraf etish, yong'in xavfsizligini ta'minlash bo'yicha rivojlangan xorijiy tajribani inobatga olgan holda amaldagi tizim samaradorligini o'rganish natijalari fuqarolarning xavfsiz hayot faoliyatiga salbiy ta'sir ko'rsatuvchi, bir qancha omillar ham mavjudligidan dalolat bermoqda [1]

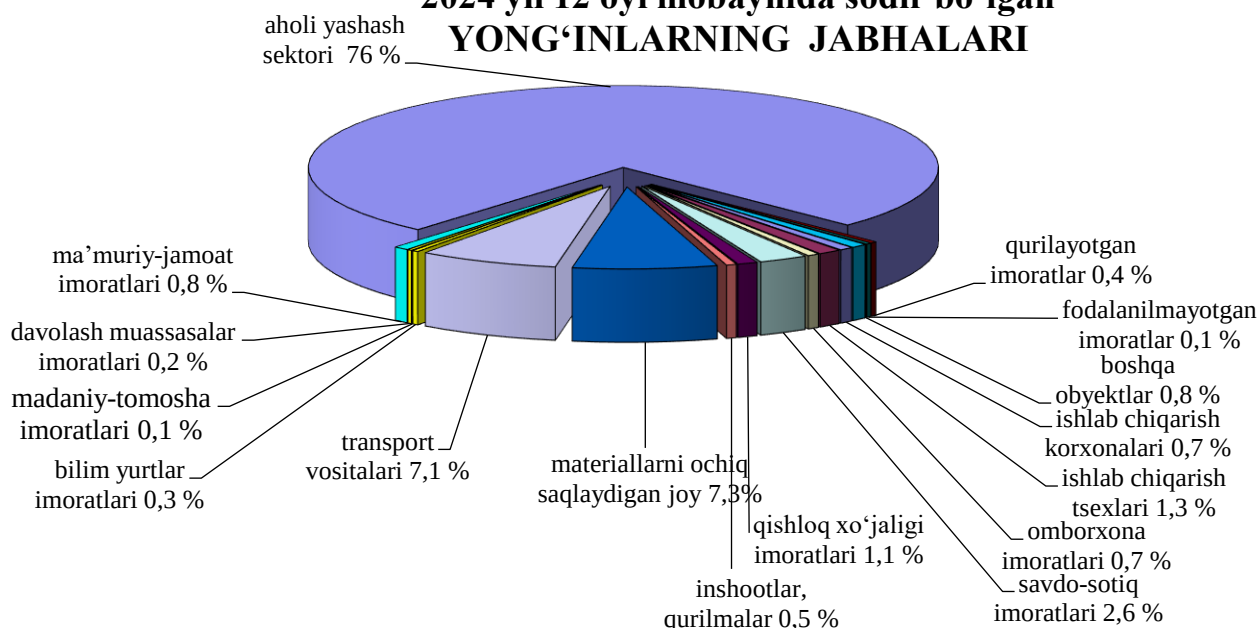
Texnogen tushdagi favqulodda vaziyatlar orasida yong'inlar o'zining keltiradigan talofatlari yuqoriligi bilar ajralib turadi. Chunki ushbu turdagi favqulodda vaziyatlarda aholining barcha qatlamlari faqat uning o'zidan emas, balki uning ikkilamchi omillari bo'lmish portlashlar, tutundan ham jabrlanish holatlari ko'p kuzatiladi. Shu sababli ham, ushbu turdagi favqulodda vaziyatlarni oldini olish va uni tizimli dastur asosida profilaktik tadbirlar asosida kamayishiga erishish muhim maqsadlardan biri hisoblanadi.

Statistik ma'lumotlarga e'tibor bersak, o'tgan 2024 yil davomida respublikamiz hududida jami 9974 ta yong'in sodir bo'lib, yong'in oqibatida 71 nafar fuqaro vafot etib, 136 nafar fuqarolar turli darajada tan jarohati olishgan. Yuzaga kelayotgan yong'inlarning davriyligi asosan iqlimning o'zgarishiga ham bevosita bog'liqligini ko'ramiz. Birgina yoz faslining iyun-iyul oylarida respublikamizda sodir bo'layotgan yong'inlarning 30% qismiga yaqini aynan o'sha davrda ro'yxatga olingan. [3]

Yuzaga kelayotgan yong'inlarning kelib chiqish jabhalari o'rganilganda Yong'inlarning jami 76% aholi yashash xonadonlarida, ma'muriy-jamoat imoratlarida 0.8%, davolash muassasalarida 0.2%, madaniy tomosha imoratlarida 0.1% , bilim yurtlari imoratlari 0.3% , transport vositalarida 7.1%, materiallarni ochiq saqlaydigan joy 7,3 % , qishloq xo'jaligi imoratlari 1,1 % , qurilayotgan imoratlar 0,4 % , qurilayotgan imoratlar 0,4 % , inshoot qurilmalar 0,5 % , savdo-sotiq imoratlari 2,6 % , ishlab chiqarish sexlari 1,3 % , omborxona imoratlari 0,7 %ni tashkil etadi. [3]

Kelib chiqish sabablariga asosan elektr uskundarida 41.5%, isitish pechlarida 10.2%, olovdan extiyotsizlik bilan foydalanish 25.9%, bolalar sho'xligi 7,7 % , transportdan foydalanishda YOXQ buzish 5,8 % , texnologik hodisalar 2,4 % , qasddan o't qo'yish 4,4 % , boshqa sabablar 0,9 %ni tashkil etadi. [3]

**O'zbekiston Respublikasi hududida
2024 yil 12 oyi mobaynida sodir bo'lgan
YONG'INLARNING JABHALARI**



Yuqoridagi tahlil ma'lumotlaridan kelib chiqib, sodir bo'layotgan yong'inlarni oldini olish va ularni kamaytirish, kelgusida insonlar sog'ligi va moddiy zararni oldini olish bo'yicha Favqulodda vaziyatlar vazirligi tomonidan hamkor tashkilotlarni jalb qilgan holda keng ko'lamli profilaktik tadbirlar amalga oshirilmoqda.

Shuningdek, 2025 yilning 20 oktabr kunida O'zbekiston Respublikasi Prezidentining "Favqulodda vaziyatlar organlari faoliyatini yanada takomillashtirishga doir tashkiliy chora tadbirlar to'g'risida"gi PQ-310-sonli qarori tasdiqlandi. Ushbu qarorga asosan aholi yashash uylarida yuzaga kelishi mumkin bo'lgan favqulodda vaziyatlarni oldini olish yuzasidan hududlardagi mahallalarda manzilli profilaktika tadbirlarini tashkil etish va uni samarali amalga oshirishda "Mahallamizni favqulodda vaziyatlardan muhofazalangan hududga aylantiramiz" shiori ostida bir qator tashkiliy mexanizmlar joriy etilishi belgilangan.

Shu bilan bir qatorda, 2025 yilning 20 oktabr kunida O'zbekiston Respublikasi Prezidentining "Favqulodda vaziyatlardan muhofaza qilish sohasini raqamlashtirish hamda ilmiy va innovatsion faoliyatini rivojlantirish chora-tadbirlari to'g'risida"gi PQ-311-sonli qarori tasdiqlangan bo'lib, ushbu qarorga muvofiq Aholi va hududlarni favqulodda vaziyatlardan muhofaza qilish tizmini raqamli transformatsiya qilish, sohaga sun'iy intellekt va robotatexnika imkoniyatlarini tatbiq etish uchun zarur shart-sharoitlarni yaratish, ilmiy tadqiqot va tajriba konstruktorlik yo'nalishlarini o'zaro integratsiya qilish orqali mahsulot ishlab chiqarish va xizmat ko'rsatishning innovatsion zanjirini yaratish asosiy maqsad etib belgilangan.

Ushbu qarorlar talablaridan ko'rinib turibdiki, hududlarda yuzaga kelishi mumkin bo'lgan texnogen tusdagi favqulodda vaziyatlar (yong'inlar)ni oldini olish

yuzasidan mahallabay va xonadonbay ishlash tartibi yo'lga qo'yilishi belgilab qo'yilgan.

Hozirgi kunda yuqoridagi qaror va buyruqlar ijrosini ta'minlash maqsadida Favqulodda vaziyatlar vazirligi hamda tegishli xizmat xodimlari tomonidan aholi yashash uylarida uyma-uy yurib yuzaga kelishi mumkin bo'lgan favqulodda vaziyatlar (yong'inlar)ni oldini olish yuzasidan profilaktik tadbirlar amalga oshirilib, tegishli yo'riqnoma va eslatmalar tarqatilishiga erishilmoqda. Ammo profilaktik tadbirlarda aholi yashash uylarida aniqlangan kamchiliklar yuzasidan tegishli xizmatlarga o'rnatilgan tartibda aloqa xati orqali murojaat qilinib, uning ijrosi ta'minlangunga qadar birmuncha vaqt ketishi mumkinligi aniqlangan. Bu esa yuzaga kelishi mumkin bo'lgan yong'inlarni keltirib chiqaradigan omillarni zudlik bilan bartaraf etishda to'sqinlik qilib, hamkor tashkilotlarning avariya-tiklash guruhini jalb etilishi vaqti kechikishiga olib keladi.

Xorij tajribalariga e'tibor qaratadigan bo'lsak, Favqulodda vaziyatlarni (yong'inlar) oldini olish yuzasidan profilaktik tadbirlar **Janubiy Koreyada "Aqlli yong'inni aniqlash IoT platformasi" (Smart Fire Detection IoT Platform)** ilovasi amaliyotda qo'llanilib, ushbu platformaning ishlash prinsipi asosan obyektlarga qo'yiladigan uskunalar yordamida amalga oshirilib, obyektidagi uskunalar yordamida yong'in kelib chiqish xavfini oldini olish va bashoratlash tadbirlari amalga oshiriladi. Ushbu platforma Har bir obyektida (uy, ofis, zavod, tunnel, transport bekati) quyidagi sensorlar o'rnatiladi: o'rnatilgan sensorlar Temperatura sensori, Dud (smoke) sensori, CO & CO₂ sensori, Gaz chiqishi sensori, Chang va is gazlar sensori, Vibratsiya sensori (portlash xavfi uchun) yagona tizimga ulanadi. Ulangan Sensorlar NB-IoT, LTE-M, 5G IoT tarmoqlari orqali axborotni uzatadi.

Xulosa va takliflar Yuqoridagilarni inobatga olib ushbu holatlarni bartaraf etish va sodir bo'lishi mumkin bo'lgan favqulodda vaziyatlar hamda yong'inlarni oldini olish yuzasidan hamkor tashkilotlar va Favqulodda vaziyatlar vazirligi o'rtasida yagona integratsiyalashtirilgan tizmi ishlab chiqilishiga ehtiyoj tug'ilayotganligini bildiradi.

Shuningdek, vazirlikning hududiy inspektorlari tomonidan yilning asosiy yong'inlar kelib chiqish xavfi yuqori davrida profilaktik tadbirlar amalga oshirishini kuchaytirish va profilaktik tadbirlar davomida aniqlangan kommunal xizmatlardagi kamchiliklarni zudlik bilan tegishli xizmatlarga yuborilishini ta'minlash uchun yagona ilova ishlab chiqilishi lozim.

Bu ilova orqali, hududlarda sodir bo'lishi mumkin bo'lgan favqulodda vaziyatlar xavfini baholash asosan yilning qaysi vaqtida qay turdagi favqulodda vaziyat sodir bo'lishi mumkinligi va ularni oldini olish va prognozlash osonlashadi. Shuningdek, hududlar kesimida yong'inlar kelib chiqishi sababi chuqur tahlil qilinib, alohida e'tiborga olish lozim bo'lgan hududlar belgilab olishi hamda aholi yashash xonadonlarida amalga oshirilishi lozim bo'lgan profilaktik tadbirlar nazoratga olinishiga erishiladi.

Foydalanilgan adabiyotlar va manbalar:

- 1.O'zbekiston Respublikasi Prezidentining 2025-yil 20-oktabr kunidagi "Favqulodda vaziyatlar organlari faoliyatini yanada takomillashtirishga doir tashkiliy chora tadbirlar to'g'risida"gi PQ-310-sonli qarori
- 2.O'zbekiston Respublikasi Prezidentining 2025-yil 20-oktabr kunidagi "Aholi va hududlarni favqulodda vaziyatlardan ishonchli muhofaza qilish sohasini sifat jihatidan yangi bosqichga ko'tarish to'g'risida" PF-185-sonli farmoni.
- 3.O'zbekiston Respublikasi Favqulodda vaziyatlar vazirligining 2024 yil davomida sodir bo'lgan favqulodda vaziyatlar to'g'risida tahlil va prognoz ma'lumoti.
4. Петтери Таалас. Изменение климата, стихийные бедствия и смягчение их последствий. 22.03.2022 <https://www.un.org/ru/173142>.
- 5.Климатическая повестка 2030 <https://russiancouncil.ru/climate2030>.

THE INDEPENDENCE OF THE ACCOUNTING CHAMBER AS A FACTOR IN THE EFFECTIVENESS OF STATE FINANCIAL CONTROL: INTERNATIONAL STANDARDS AND NATIONAL PRACTICE

Annotation: *This article examines the conceptual relationship between the level of institutional independence of the Accounting Chamber and the effectiveness of the state financial control system. The author conducts a comprehensive comparative analysis of the provisions of the Lima and Mexican INTOSAI Declarations, comparing the international standards of independence of the supreme financial control authorities (SAIS) with the current national practice of the Republic of Uzbekistan. Special attention is paid to the eight basic principles of independence, including functional autonomy, financial self-sufficiency, and the right to unrestricted access to information. The article analyzes the recent constitutional reforms in Uzbekistan, which consolidated the status of the Accounting Chamber as the highest financial supervisory authority, and suggests ways to further implement international standards into national legislation.*

Keywords: *Accounting Chamber, state financial control, INTOSAI, SAIS independence, efficiency audit, budget transparency, financial autonomy, public administration, corruption risks.*

In the context of global economic instability and the transformation of public administration models, issues of ensuring the sustainability of national financial systems are of paramount importance. The key mechanism guaranteeing the targeted and effective use of public resources is the State Financial Control (GFC). However, the modern scientific paradigm and international practice convincingly prove that the effectiveness of GFC is directly deterministic depending on the degree of institutional, functional and financial independence of the body exercising this control. For the supreme Financial Control bodies (SAIS), which include the Accounting Chamber, independence is not a departmental preference or political immunity. On the contrary, it is a fundamental methodological condition, without which an objective audit and an impartial assessment of the activities of the executive become impossible. In the absence of real autonomy, the supervisory authority risks becoming a tool for legitimizing managerial mistakes, which in the long run leads to a erosion of budgetary discipline and an increase in systemic corruption risks. [1].

The documents of the International Organization of Supreme Audit Institutions (INTOSAI), primarily the Lima and Mexican Declarations, are the global standard in this area. These acts postulate that sais can effectively perform

their tasks only when they are protected from any external influence, both from the audited entities and from political institutions. [2; 5].

Independence in this context is considered as a complex category, including the right to independently determine the audit program, unhindered access to information and, critically, financial self-sufficiency. As world practice shows, even a slight dependence of the budget of the Accounting Chamber on the decisions of the Ministry of Finance can be used as a lever of indirect pressure on the results of inspections. [6].

For the Republic of Uzbekistan, the issue of strengthening the status of the Accounting Chamber has become particularly relevant in the framework of the implementation of the Strategy "Uzbekistan – 2030" and large-scale constitutional reforms. The transition to a qualitatively new system of state audit requires not only technological modernization (the introduction of e-audit systems), but also a deep rethinking of the legal guarantees of the independence of the supreme audit institution. In the updated Constitution of the Republic of Uzbekistan, the Accounting Chamber is fixed as the body of the supreme state financial control, which creates a solid foundation for its functioning as an independent arbitrator in the budgetary process. [3].

Nevertheless, the transition from formal legal independence to actual efficiency requires solving a number of applied tasks: from improving accountability mechanisms to Parliament to the introduction of international standards on performance Auditing. This article is aimed at a comprehensive analysis of the compliance of Uzbekistan's national practice with INTOSAI international standards. The relevance of the study is determined by the need to find the optimal balance between state coercion and the development of partnerships between the control body and the audited entities in order to maximize the socio-economic effect of using budgetary funds. Thus, the study of the independence of the Accounting Chamber as a factor of effective control allows us to develop scientifically sound recommendations for further improvement of the GFC system in the context of the digital transformation of the economy.

The analysis of the effectiveness of the supreme financial Control bodies (SAIS) requires an in-depth study of the correlation between their institutional autonomy and real macroeconomic indicators. World practice clearly confirms that the strengthening of the independence of the Accounting Chamber directly affects the position of the state in global transparency ratings. In particular, according to the results of the international Open Budget Survey for 2023, the Republic of Uzbekistan has demonstrated significant progress in ensuring the openness of public finances, reaching a score of 45 out of 100 possible points. This result was the result of the expansion of the powers of the Accounts Chamber in terms of conducting audit coverage and ensuring the publicity of expert opinions on draft state budgets. [6].

The effectiveness of national financial control in the period 2024-2025 is clearly confirmed by concrete economic results. According to the official data of the Accounting Chamber, announced in July 2025, the use of preventive control

methods prevented inefficient government spending totaling 5.6 trillion soums. It is important to emphasize that the achievement of such indicators became possible due to the strengthening of the functional independence of the body, which is expressed in the transition from subsequent control (revision of facts) to a preliminary analysis of the validity of budget allocations. At the same time, additional budget reserves were identified during remote monitoring, which indicates the high analytical potential of an independent audit. [2; 7].

Digital transformation and the introduction of the state audit system (e-audit) occupy a special place in ensuring the objectivity of control. Automation of control processes allowed the Accounting Chamber to minimize the human factor and eliminate the subjective interference of the audited departments in the audit process. As a result of the use of remote monitoring technologies, violations amounting to 4.0 trillion soums were identified and eliminated in the first half of 2025 alone. In addition, by the end of 2024, violations in the amount of 4.5 trillion soums were recorded in the field of public procurement, which underlines the critical role of the Accounting Chamber in ensuring fair competition and the rational use of public funds. [4; 8].

The anti-corruption component of the Accounts Chamber's activities is also directly dependent on its institutional immunity. An analysis of law enforcement practice in 2024 shows that the damage from identified corruption crimes in the national economy amounted to 2.8 trillion soums. The sharp increase in the number of persons prosecuted for financial abuse — up to 7,354 people, which is 12.5% more than the previous year — indicates not so much an increase in crime as an increase in the effectiveness of control. Thus, the de facto independence of the Accounting Chamber allows it to act as an impartial arbitrator, whose conclusions become a reliable basis for the implementation of the principle of the inevitability of punishment for budget offenses. [5].

The conducted research allows us to draw a fundamental conclusion that the independence of the Accounting Chamber is not only a legal category, but also a key determinant of the macroeconomic stability of the state. In modern conditions of public administration in the Republic of Uzbekistan, the institutional autonomy of the supreme financial Control authority (SAIS) acts as a guarantor of protecting the interests of taxpayers and the effectiveness of the allocation of public resources. Based on INTOSAI international standards, it can be stated that only if there is real functional and financial independence, control is transformed from a formal procedure for fixing violations into a strategic instrument of state audit.

During the analysis of the current national practice, several key scientific conclusions were formulated. Firstly, the constitutional consolidation of the Accounts Chamber's status in 2023 created the necessary foundation for the implementation of the principles of the Lima Declaration, which significantly reduced the risks of political pressure on audit reports. Secondly, the transition to a remote monitoring system and digitalization of processes (e-audit) have become a factor of technological independence, ensuring the prevention of inefficient budget expenditures in the amount of more than 5.6 trillion soums in the first half of 2025.

Thirdly, the revealed direct correlation between the growth of the Open Budget Index and the expansion of the powers of the Accounts Chamber confirms that transparency of financial control is a prerequisite for attracting foreign investment and increasing confidence in the national financial system. [3; 6; 7].

Based on the research results, a number of practical measures are proposed to further improve the system of state financial control. First of all, it seems necessary to legislatively strengthen the eighth principle of the Mexican Declaration, concerning the full financial autonomy of the Accounting Chamber, by consolidating the procedure for direct approval of its budget by Parliament without prior approval from the Ministry of Finance. This will eliminate any mechanisms of indirect influence on the activities of the supervisory authority. In addition, it is advisable to expand the methodological base of Performance Audit, shifting the focus from checking compliance with legislation to assessing the final socio-economic effect of the implementation of government programs.

As a strategic recommendation, it is also proposed to introduce a mechanism for mandatory public discussion of Accounts Chamber reports in the chambers of the Oliy Majlis with the involvement of civil society institutions. This approach will not only strengthen the accountability of regulatory authorities, but also create a system of dual control, in which the independence of SAIS will be supported by public monitoring. The implementation of these proposals will allow Uzbekistan not only to fully implement INTOSAI international standards, but also to form one of the most effective public audit systems in the Central Asian region, capable of ensuring the long-term sustainability of public finances. [1; 4; 8].

References

1. The Constitution of the Republic of Uzbekistan (as amended in 2023).
2. The Law of the Republic of Uzbekistan "On the Accounts Chamber of the Republic of Uzbekistan" dated 18.10.2019. ZRU-546.
3. The official report of the Accounts Chamber of the Republic of Uzbekistan for the first half of 2025. Tashkent, 2025.
4. Statistical collection of the Anti-Corruption Agency of the Republic of Uzbekistan for 2024.
5. International Budget Partnership. Open Budget Survey 2023: Global Report. URL: <https://internationalbudget.org>.
6. Газета.uz. Счётная палата выявила неэффективные расходы на 5,6 трлн сумов. Опубликовано 24.07.2025.
7. INTOSAI-P 10. Mexico Declaration on SAI Independence. [Электронный ресурс]. URL: <https://www.intosai.org>.
8. AG Alisherovna, KA Alisherovich – 2022. Some issues the impact of the shadow economy on the development of the recreational tourism industry in uzbekistan. <https://wos.academiascience.org/index.php/wos/article/view/621>
9. Alimova, G. A. (2024). GLOBAL DIGITALIZATION AND THE PLACE OF UZBEKISTAN. International journal of Business, Management and Accounting, 4(2).

10. Алимова, Г. А., & Умарова, К. Б. (2014). Методика определения пороговых значений дифференциации населения. Научный аспект, (1-2), 136-141.

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ELEKTROMOBILLARNING TUZILISHI VA ULARGA SERVIS XIZMAT KO'RSATISH

Annotatsiya: mazkur maqolada elektromobillarning texnik tuzilishi, ularning asosiy tarkibiy qismlari hamda servis xizmat ko'rsatishning o'ziga xos jihatlari tahlil qilingan. Shuningdek, elektromobillarga texnik xizmat ko'rsatishning an'anaviy ichki yonuv dvigatelli avtomobillardan farqli jihatlari va ularning ekspluatatsion afzalliklari yoritilgan.

Kalit so'zlar: elektromobil, elektr dvigatel, akkumulyator batareyasi, servis xizmati, texnik xizmat ko'rsatish, zaryadlash tizimi.

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STRUCTURE AND MAINTENANCE OF ELECTROMOBILES

Abstract: This article analyzes the technical structure of electric vehicles, their main components, and specific aspects of service provision. Also, the differences between electric vehicle maintenance and traditional cars with internal combustion engines and their operational advantages are highlighted.

Keywords: electric car, electric motor, battery, service, maintenance, charging system.

So'nggi yillarda global miqyosda ekologik muammolarning kuchayishi, an'anaviy yoqilg'i resurslarining kamayib borishi hamda transport sohasida energiya tejamkor texnologiyalarga bo'lgan ehtiyojning ortishi elektromobillarning keng joriy etilishiga turtki bermoqda. Xalqaro energetika agentligi ma'lumotlariga ko'ra, 2023-yilda dunyo bo'yicha elektromobillar soni 40 million donadan oshgan bo'lib, ularning yillik o'sish sur'ati 30–35 foizni tashkil etmoqda [1]. Bu holat elektromobillarning zamonaviy transport tizimidagi ahamiyati tobora ortib borayotganini ko'rsatadi.

Elektromobillar ichki yonuv dvigatelli avtomobillardan tubdan farq qiluvchi tuzilishga ega bo'lib, ularning asosiy harakatlantiruvchi qismi elektr dvigatel va yuqori sig'imli akkumulyator batareyalaridan iborat. Ushbu transport vositalari atmosferaga zararli gazlar chiqarmasligi, yoqilg'i sarfining mavjud emasligi hamda texnik xizmat ko'rsatish xarajatlarining pastligi bilan ajralib turadi. Tadqiqotlarga ko'ra, elektromobillarning ekspluatatsiya xarajatlari an'anaviy avtomobillarga nisbatan 30–40 foizga kam bo'ladi [2].

O'zbekiston Respublikasida ham ekologik toza transport turlarini rivojlantirish davlat siyosatining muhim yo'nalishlaridan biri hisoblanadi. Xususan, "Raqamli O'zbekiston – 2030" strategiyasi va transport sohasini rivojlantirish dasturlari doirasida elektromobillarni joriy etish, ularga servis xizmat ko'rsatish infratuzilmasini kengaytirish bo'yicha tizimli chora-tadbirlar amalga oshirilmoqda. Bu esa elektromobillarni texnik jihatdan chuqur o'rganish va ularga xizmat ko'rsatish tizimini takomillashtirish zaruratini yuzaga keltirmoqda [3].

Shu boisdan, elektromobillarning tuzilishi, ularning asosiy texnik qismlari hamda servis xizmat ko'rsatish xususiyatlarini ilmiy jihatdan o'rganish bugungi kunda dolzarb masalalardan biri hisoblanadi.

Elektromobillar an'anaviy ichki yonuv dvigatelli avtomobillardan tubdan farq qiluvchi konstruksiyaga ega. Ularning asosiy farqi energiya manbai va harakatlantiruvchi mexanizmidir. Elektromobilning asosiy tarkibiy qismlari quyidagilardan iborat: elektr dvigatel, akkumulyator batareyasi, invertor, zaryadlash tizimi hamda boshqaruv elektronikasidan iborat [4].

Elektr dvigatel elektromobilning yurak qismi bo'lib, elektr energiyasini mexanik energiyaga aylantiradi. Zamonaviy elektromobillarda asosan sinxron va asinxron turdagi yuqori samaradorlikka ega dvigatellar qo'llaniladi. Ularning foydali ish koeffitsienti 85–95 % ni tashkil etadi, bu esa ichki yonuv dvigatellariga nisbatan ancha yuqori ko'rsatkichdir [5].

Akkumulyator batareyasi elektromobilning asosiy energiya manbai bo'lib, ko'pincha litiy-ion yoki litiy-temir-fosfat (LiFePO_4) turidan foydalaniladi. Ushbu batareyalar yuqori energiya zichligi, uzoq xizmat muddati va tez zaryadlanish xususiyatiga ega. Tadqiqotlarga ko'ra, zamonaviy elektromobil batareyalarining xizmat muddati o'rtacha 8–10 yilni tashkil etadi [6].

Invertor esa batareyadan kelayotgan doimiy tokni o'zgaruvchan tokka aylantirib, elektr dvigateling barqaror ishlashini ta'minlaydi. Bundan tashqari, elektromobillarda energiyani qayta tiklash tizimi (rekuperatsiya) mavjud bo'lib, tormozlanish vaqtida energiya qayta akkumulyatorga uzatiladi.

Elektromobillarga servis xizmat ko'rsatish an'anaviy avtomobillarga nisbatan ancha soddaroq bo'lib, u kamroq texnik xizmat turlarini talab qiladi. Chunki elektromobillarda dvigatel moyi, yonilg'i tizimi, gaz taqsimlash mexanizmi kabi murakkab uzellar mavjud emas.

Asosiy servis ishlari quyidagilardan iborat:

akkumulyator holatini diagnostika qilish;

elektr dvigatel va invertorni tekshirish;

sovitish tizimini nazorat qilish;

tormoz tizimi va shinalarni tekshirish;

dasturiy ta'minotni yangilash.

Mutaxassislar fikriga ko'ra, elektromobillarga texnik xizmat ko'rsatish xarajatlari ichki yonuv dvigatelli avtomobillarga nisbatan 30–40 % ga kam bo'ladi. Bunga ehtiyot qismlarning kamligi va mexanik eskirish darajasining pastligi sabab bo'ladi.

Biroq elektromobillarga xizmat ko'rsatishda yuqori kuchlanish bilan ishlash xavfi mavjud bo'lib, servis xodimlaridan maxsus bilim va malaka talab etiladi. Ayniqsa, batareyani ta'mirlash yoki almashtirish jarayonida xavfsizlik qoidalariga qat'iy rioya qilish zarur.

Elektromobillar quyidagi ustunliklarga ega:
ekologik tozaligi (CO₂ chiqindilari yo'q);
yoqilg'i xarajatlarining mavjud emasligi;
texnik xizmat ko'rsatishning soddaligi;
shovqinsiz ishlashi;
energiya samaradorligining yuqoriligi.

Xalqaro tajribaga ko'ra, elektromobillarni keng joriy etish orqali shahar havosining ifloslanish darajasini 25–30 % ga kamaytirish mumkin.

Xulosa qilib aytganda, elektromobillar zamonaviy transport tizimining istiqbolli yo'nalishlaridan biri hisoblanadi. Ularning texnik tuzilishi sodda, energiya samaradorligi yuqori hamda ekspluatatsiya xarajatlari kamligi bilan ajralib turadi. Elektromobillarga servis xizmat ko'rsatish jarayoni ham an'anaviy avtomobillarga nisbatan ancha qulay bo'lib, kam texnik xizmat talab etadi.

O'zbekiston sharoitida elektromobillarni keng joriy etish ekologik muammolarni kamaytirish, energiya resurslaridan samarali foydalanish hamda transport sohasini modernizatsiya qilishga xizmat qiladi. Shu bois elektromobillarni texnik jihatdan chuqur o'rganish, servis xizmatlarini rivojlantirish va malakali mutaxassislar tayyorlash muhim ahamiyat kasb etadi.

Foydalanilgan adabiyotlar

1. International Energy Agency (IEA). Global EV Outlook 2023. – Paris, 2023.
2. Karimov A. Avtomobillar tuzilishi va ekspluatatsiyasi. – Toshkent: Fan, 2020.
3. Xudoyberdiyev B. Elektr transport vositalari asoslari. – Toshkent: Texnika, 2021.
4. International Energy Agency (IEA). Global EV Outlook 2023. – Paris, 2023.
5. Karimov A. Avtomobillar tuzilishi va ekspluatatsiyasi. – Toshkent: Fan, 2020.
6. O'zbekiston Respublikasi Transport vazirligi. Elektromobillarni rivojlantirish bo'yicha tahliliy hisobot, 2023.
7. Adilov, O., Umirov, I., & Umirova, G. (2024, March). Usage of secondary wind energy device in automobile exploitation. In *AIP Conference Proceedings* (Vol. 3045, No. 1). AIP Publishing.
8. Ilkhom, U., & Shokhzod, S. (2022). Studying the experience of international traffic safety management. *Journal of Academic Research and Trends in Educational Sciences*, 1(4), 83-89.

ANALYSIS OF ENERGY EFFICIENCY INDICATORS OF SOLAR POWER SUPPLY SYSTEMS

Abstract. *The article examines key energy efficiency indicators of solar power supply systems and their impact on reliability and economic efficiency. The results show that improved energy efficiency enhances the sustainable operation of energy systems.*

Keywords: *solar power supply, energy efficiency, renewable energy, performance indicators, sustainability.*

Introduction

The rapid development of renewable energy technologies has significantly transformed modern power supply systems. Among renewable energy sources, solar power occupies a leading position due to its environmental friendliness, scalability, and technological maturity. Solar power supply systems are widely used in residential, commercial, and industrial sectors, contributing to energy diversification and reduction of greenhouse gas emissions. However, the effectiveness of solar energy utilization largely depends on the energy efficiency of solar power systems. Energy efficiency indicators play a crucial role in evaluating system performance, determining economic feasibility, and ensuring sustainable operation. Low efficiency leads to increased capital and operational costs, while optimized efficiency enhances system reliability and return on investment. Therefore, analyzing energy efficiency indicators of solar power supply systems is an important scientific and practical task. This study focuses on identifying key indicators and assessing their influence on the overall performance of solar energy systems.

Methods and materials

The research is based on a comprehensive methodological approach combining technical and economic analysis. The following methods were applied:

- analysis of solar power system performance parameters;
- evaluation of energy efficiency indicators;
- comparison of different system configurations;
- assessment of economic and environmental impacts.

The object of the study is a typical photovoltaic (PV) power supply system consisting of solar panels, inverters, energy storage units, and auxiliary equipment. The analysis considers both grid-connected and standalone solar power systems operating under various climatic and load conditions. Energy efficiency indicators

were calculated using standard engineering approaches and international recommendations for solar energy systems.

Energy efficiency indicators of solar power supply systems

Energy efficiency of solar power systems is characterized by a set of quantitative indicators reflecting the ability of the system to convert solar radiation into usable electrical energy. The main indicators include:

- Photovoltaic efficiency, which shows the ratio of electrical output to incident solar energy;
- Performance Ratio (PR), reflecting system losses and overall performance;
- Capacity Utilization Factor (CUF), indicating the actual energy output relative to the maximum possible output;
- System efficiency, accounting for inverter, wiring, and storage losses.

These indicators provide a comprehensive assessment of solar power system performance and allow identification of inefficiencies at different stages of energy conversion.

Factors affecting energy efficiency

Several factors influence the energy efficiency indicators of solar power supply systems:

- solar radiation intensity and climatic conditions;
- orientation and tilt angle of photovoltaic panels;
- quality and type of photovoltaic modules;
- inverter efficiency and control strategy;
- temperature effects and shading losses.

Improper system design or unfavorable operating conditions can significantly reduce efficiency. Therefore, optimization of system configuration and operating modes is essential to achieve high performance.

Economic aspects of energy efficiency improvement

Energy efficiency directly affects the economic performance of solar power supply systems. Higher efficiency leads to increased energy generation, reduced payback period, and improved investment attractiveness. Economic evaluation includes analysis of capital costs, operational expenses, energy savings, and lifecycle cost. Improving energy efficiency indicators reduces the levelized cost of electricity (LCOE) and enhances competitiveness of solar energy compared to conventional power sources. In many cases, investments in efficiency improvements are economically justified with payback periods ranging from 3 to 7 years.

Environmental and sustainability impact

High energy efficiency of solar power systems contributes to environmental sustainability by reducing resource consumption and minimizing carbon emissions. Efficient systems require fewer photovoltaic panels and auxiliary components, lowering material usage and environmental footprint. Additionally, improved efficiency supports energy security and sustainable development goals by increasing the share of renewable energy in the power supply mix.

Discussion of results

The analysis shows that energy efficiency indicators are critical parameters determining the technical and economic success of solar power supply systems. Integrated optimization of system design, component selection, and operating conditions allows significant improvement in efficiency and overall performance. The results confirm that systematic evaluation of efficiency indicators should be an integral part of solar power system planning and operation.

Conclusion

This study analyzed the energy efficiency indicators of solar power supply systems and assessed their technical, economic, and environmental significance. It was established that improving efficiency indicators enhances system reliability, reduces energy costs, and increases economic sustainability. The findings can be used in the design, modernization, and evaluation of solar power supply systems in various applications.

References

1. IEA. Renewables 2022: Analysis and Forecasts. International Energy Agency, 2022.
2. Duffie J.A., Beckman W.A. Solar Engineering of Thermal Processes. Wiley, 2019.
3. ISO 14040. Environmental Management – Life Cycle Assessment.
4. REN21. Renewables Global Status Report. 2023.
5. World Bank. Solar Energy Development. 2021.

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**TOSHKENT VILOYATI FERMER XO‘JALIKLARIDA MAHSULOT (ISH,
XIZMATLAR) YETISHTIRISH JARAYONLARINI STATISTIK
BAHOLASH**

Annotatsiya: *Mazkur maqolada fermer xo‘jaliklari faoliyatini samaradorligini oshirish va uni statistik usullarda baholash masalalari ko‘rib chiqiladi. Fermer xo‘jaliklari faoliyatining samaradorligini baholash bo‘yicha zamonaviy statistik usullar va ko‘rsatkichlar tahlil qilinadi. Statistik tahlil orqali xo‘jaliklarning resurslardan foydalanish darajasi va ishlab chiqarish samaradorligi o‘rganiladi. Maqola qishloq xo‘jaligi sohasida optimal qarorlar qabul qilishda yordam beruvchi asosiy omillarni aniqlashga qaratilgan.*

Kalit so‘zlar: *Fermer xo‘jaliklari, samaradorlik, statistik baholash, qishloq xo‘jaligi, tahlil usullari.*

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**STATISTICAL EVALUATION OF THE PROCESSES OF
PRODUCING GOODS (WORK, SERVICES) IN FARM ENTERPRISES OF
THE TASHKENT REGION**

Abstract: *This article addresses issues of improving the efficiency of farm operations and evaluating them through statistical methods. Modern statistical methods and indicators used for assessing farm efficiency are analyzed. Statistical analysis is employed to study the level of resource utilization and production efficiency within farms. The article aims to identify key factors that aid in making optimal decisions in the agricultural sector.*

Key words: *farm operations, efficiency, statistical evaluation, agriculture, analysis methods.*

Kirish

Butun dunyo miqyosida bosqichma-bosqich amalga oshirilib kelinayotgan islohotlar fermer xo‘jaligi faoliyati bilan shug‘ullanuvchi sub’ektlarning bozor munosabatlarini ta‘minlaydigan erkin iqtisodiy makonni vujudga keltirmoqda. Jahonda iqtisodiy islohotlarning chuqurlashib borishi, iqtisodiyotning tobora erkinlashib borishini, jamiyatdagi modernizasiya jarayonlarining jadallashishi

bozor munosabatlarining ham takomillashib borishiniga zamin yaratmoqda. Mamlakatimiz iqtisodiyotida amalga oshirib kelinayotgan islohotlar natijasida vujudga kelgan fermer xo'jaliklari barqaror va samaradorlik darajasi yuqori bo'lishi lozim. "Dunyo mamlakatlarida korxonalar hajmi qishloq xo'jaligining o'ziga xos xususiyatlarini mintaqaning tabiiy-iqlim sharoitlari, yer va geografik, inson omilini hisobga olgan tarzda iqtisodiy oqibat natijalariga ko'ra shakllanadi, qishloq xo'jalik mahsulotlarining asosiy qismi fermer xo'jaliklarida yetishtiriladi. Kanadada bir fermer xo'jaligiga o'rtacha 215 gektar, AQSHda 145 gektar, Germaniyada 19,5 gektar, Belgiya va Gollandiyada 17,0 gektar, Italiyada 8,5 gektar yer to'g'ri keladi"³. Bugungi kunda jahonda fermer xo'jaliklarida mahsulot (ish, xizmatlar) yetishtirish jarayonlarini statistik baholash aholini xavfsiz oziq-ovqat mahsulotlariga bo'lgan talabni ta'minlashning asosiy manbai sifatida qaralmoqda.

O'zbekiston iqtisodiyotida qishloq xo'jaligi tarmog'i yetakchi sohalardan biri bo'lib, uning tarkibida fermer xo'jaliklari alohida o'rin egallaydi. Fermer xo'jaliklari mamlakat oziq-ovqat xavfsizligini ta'minlash, eksport salohiyatini oshirish hamda hududiy ijtimoiy-iqtisodiy rivojlanishga sezilarli hissa qo'shib kelmoqda. Shu sababli fermer xo'jaliklarida mahsulot (ish, xizmatlar) yetishtirish jarayonlarini statistik baholash va istiqboldagi rivojlanish yo'nalishlarini belgilash dolzarb masalalardan biridir.

O'zbekiston Respublikasi Prezidentining 2023-yil 11-sentabrdagi "O'zbekiston — 2030" strategiyasi to'g'risida" gi PF-158-sonli Farmonida – "Iqtisodiyotning eng tez o'sib borayotgan yo'nalishlarida amaliy tadqiqotlarni kuchaytirish, "korxona — oliygoh — ilmiy tashkilot" klaster tizimini joriy etish doirasida amaliy tadqiqotlarga Davlat budjetidan 4 trillion so'm mablag' yo'naltirish, iqtisodiyot tarmoqlarining "drayver" yo'nalishlarida 850 turdagi innovatsion mahsulotlar ishlab chiqarish, amaliy tadqiqotlar natijalari asosida 2,5 mingdan ziyod yangi ilmiy ishlanmalar yaratish, transport va logistika, qishloq xo'jaligida hosildorlik, energetika, biotexnologiya, geologiya va metallni qayta ishlash, mashinasozlik va elektronika yo'nalishlarida 8 ta ilmiy ishlab-chiqarish klasterini tashkil etish"⁴ kabi bir qator ustuvor vazifalar belgilandi.

Qishloq, o'rmon va baliqchilik xo'jaligi O'zbekiston iqtisodiyotining muhim tarmoqlaridan biri bo'lib, unda fermer xo'jaliklarining o'rni beqiyosdir. Toshkent viloyati respublikaning iqtisodiy va agrar salohiyati yuqori hududlaridan biri hisoblanadi. Fermer xo'jaliklarida mahsulot (ish, xizmatlar) yetishtirish jarayonlarini statistik jihatdan baholash ularning faoliyat samaradorligini aniqlash, mavjud resurslardan foydalanish darajasini o'rganish hamda kelgusidagi rivojlanish yo'nalishlarini belgilash imkonini beradi

Tadqiqot metodologiyasi

Fermer xo'jaliklari – qishloq xo'jaligi ishlab chiqaruvchilari sifatida alohida iqtisodiy subyekt hisoblanadi. Ular yuridik jihatdan mustaqil bo'lib, yer maydonidan samarali foydalanish, mahsulot yetishtirish va uni realizatsiya qilish

³<https://genderi.org/reja-i-kirish-ii-fermer-xojaliklari-va-ularning-tashkiliy-iqt.html?page=3>. ma'lumotlari.

⁴ O'zbekiston Respublikasi Prezidentining 2023-yil 11-sentabrdagi "O'zbekiston — 2030" strategiyasi to'g'risida" gi PF-158-sonli Farmoni. <https://lex.uz/uz/docs/-6600413>

orqali o'z faoliyatini amalga oshiradi. Tadqiqot jarayonida statistik kuzatish, guruhlash, taqqoslash, dinamik qatorlar tahlili, o'rtacha va nisbiy ko'rsatkichlar usullaridan foydalanildi.

Statistik usullar orasida dinamik qatorlarni o'rganish, variatsion tahlil, o'rtacha ko'rsatkichlar, korrelyatsion-regression modellari, indeks usullari keng qo'llaniladi. Ayniqsa, fermer xo'jaliklari faoliyatida ishlab chiqarish hajmi va samaradorlik ko'rsatkichlarini o'rganishda o'rtacha me'yoriy ko'rsatkichlardan foydalanish muhimdir.

Toshkent viloyati mamlakatimizning iqtisodiy jihatdan rivojlangan hududlaridan biri bo'lib, qishloq xo'jaligi bu yerda yetakchi sohalardan hisoblanadi. Hududning geografik joylashuvi, iqlim sharoiti, yer resurslari va infratuzilmasi fermer xo'jaliklari uchun qulay imkoniyatlar yaratadi.

So'nggi yillarda davlat tomonidan qishloq xo'jaligini modernizatsiya qilish, fermer xo'jaliklarini qo'llab-quvvatlash, kredit va subsidiyalar ajratish natijasida fermer xo'jaliklari soni va samaradorligi oshib bormoqda.

Natija va muhokama

Bizga ma'lumki ijobiy natijalarga erishishda davlatimiz rahbarining fermer xo'jaliklarining, tomorqa yer egalari va dehqon xo'jaliklari faoliyatida zamonaviy tashkiliy tizimni joriy qilish va moliyaviy qo'llab-quvvatlashning qo'shimcha chora-tadbirlari to'g'risidagi farmonlari juda ahamiyat kasb etdi.

1-jadval

**Toshkent viloyatida qishloq xo'jaligi bo'yicha asosiy ko'rsatkichlari
dinamikasining o'zgarishi⁵**

Ko'rsatkichlar	Yillar				
	2020	2021	2022	2023	2024
Qishloq xo'jaligi ekinlari ekin maydoni, gektar	298166	290296	295760,5	289297,7	294981,7
Qishloq xo'jaligi mahsuloti, mlrd. so'm	23875,1	29538,3	33010,8	38779,8	41311,8
shu jumladan:					
dehqonchilik	10831,0	13965,4	16283,3	18432,3	19321,6
chorvachilik	13044,1	15572,9	16727,4	20347,6	21990,2
Qishloq xo'jaligi mahsulotlari ishlab chiqarish-ning o'sish sur'ati, o'tgan yilga nisbatan foizda	100,1	104,1	104,2	105,2	102,0
shu jumladan:					
dehqonchilik	100,5	104,5	106,0	103,7	101,2
chorvachilik	99,7	103,8	102,7	106,6	102,7

Toshkent viloyati bo'yicha "2024- yilda qishloq, o'rmon va baliqchilik xo'jaligi mahsulot (xizmat)larining umumiy hajmi 44379,0 mlrd. so'mni yoki 2023-yilga nisbatan 101,4 % ni, shu jumladan, dehqonchilik va chorvachilik, ovchilik va ushbu sohalarda ko'rsatilgan xizmatlar – 42 108,8 mlrd. so'mni (101,6 %), o'rmon xo'jaligi – 1 749,6 mlrd. so'mni (104,0 %), baliqchilik xo'jaligi – 520,6 mlrd.

^{5 5} Toshkent viloyati statistika boshqarmasining 2020-2024 yillik ma'lumotlari tuzildi.

soʻmni (77,5 %) tashkil qildi. Respublika qishloq, oʻrmon va baliqchilik xoʻjaligi tarkibida Toshkent viloyatining ulushi 9,5 % ni tashkil etdi”⁶. (1-jadval)

Shu sababli, “Rasmiy statistikani tayyorlovchilar rasmiy statistikaning sifatini doimiy asosda baholab boradi. Sifat kafolatini taʼminlash uchun rasmiy statistika rasmiy statistikaning qamrovi, tushunchalari, statistik birliklari va tasniflariga taalluqli umumiy prinsiplar hamda usullar asosida tayyorlanadi va tarqatiladi”⁷

Shu sababli, ushbu dinamika qatorlarini tahlil qilish koʻrsatkichlar hisoblanadi:

1. “Mutlaq qoʻshimcha oʻsish yoki kamayish - har qaysi keyingi davr darajasidan boshlangʻich yoki oʻzidan oldingi davr darajasini ayirish yoʻli bilan aniqlanadi.

$$\Delta_{i/i-1} = Y_i - Y_{i-1} \quad \Delta_{i/i_0} = Y_i - Y_0 \quad (1)$$

2. Oʻsish yoki kamayish koeffitsienti yoki surʼati ($K_{o.k.}$) - har qaysi keyingi davr darajasi boshlangʻich yoki oʻzidan oldingi davr darajasiga nisbatan qancha marta katta yoki kichik ekanligini yoki qancha foiz tashkil etishini koʻrsatadi.

$$K_{i/i-1} = Y_i / Y_{i-1}; \quad T_{i/i-1} = Y_i \cdot 100 / Y_{i-1}; \quad K_{i/i_0} = Y_i / Y_0; \quad T_{i/i_0} = Y_i \cdot 100 / Y_0$$

(2)

3. Qoʻshimcha oʻsish (kamayish) surʼati (D) ham ikki usulda aniqlanishi mumkin. Birinchi usulda har bir keyingi davr darajasidan boshlangʻich davr darajasi ayirilib, 100 ga yuqoriytiriladi va boshlangʻich davr darajasiga boʻlinadi.

$$\Delta_{i/i_0} = \frac{\sum (Y_i - Y_0) \cdot 100}{Y_0} \quad (3)$$

Ikkinchi usulda har bir keyingi davr darajasidan oldingi davr darajasi ayirilib, 100 ga yuqoriytiriladi va oʻzidan oldingi yil darajasiga boʻlinadi.

$$\Delta_{T_{i/i_0}} = \frac{\sum (Y_i - Y_{i-1}) \cdot 100}{Y_{i-1}} \quad (4)$$

1% qoʻshimcha oʻsish (kamayish)ning mutlaq qiymati – mutlaq qoʻshimcha oʻsish qiymati zanjirsimon qoʻshimcha oʻsish surʼatiga boʻlinadi”⁸.

$$\Delta_{i/i-1} : \Delta_{T_{i/i-1}} \quad (5)$$

Quyida **Toshkent viloyatida fermer xoʻjaliklarining yalpi ishlab chiqarish xajmi** dinamikasining tahliliy koʻrsatkichlarini keltiramiz.

⁶ Toshkent viloyati statistika boshqarmasining maʼlumotlari asosida muallifning hisob-kitoblari

⁷ Oʻzbekiston Respublikasining “Rasmiy statistika toʻgʻrisida” gi OʻRQ - 707 – sonli qonuni. 2021 yil. 11 avgust. . www.lex.uz

⁸ N.M. Soatov, N.Gʻ. Nabiyeu, A.H. Aybjonov. Amaliy statistika. Darslik. Toshkent-2020 y. 593 bet.

2-jadval

**Toshkent viloyatida fermer xo'jaliklarining yalpi ishlab chiqarish
xajmi dinamikasini o'zgarishi⁹**

Yillar	Fermer xo'jaliklari yalpi ishlab chiqarishi, mln.so'm , (Y) (taqqoslama baholarda)	Absolyut qo'shimcha o'sish, mln.so'm		O'sish sur'ati, %		Qo'shimcha o'sish sur'ati, %		1 %li qo'shimcha o'sish (yoki kamayish)ning mutloq mohiyati, mlrd.so'm	
		Bazisli	Zanjirli	Bazisli	Zanjirli	Bazisli	Zanjirli	$\frac{[u_i - y_{i-1}]}{[(U_i/Y_{i-1}) \times 100] - 100}$	$(Y_{i+1})/100$
		$Y - Y_0$	$Y_i - Y_{i-1}$	$(Y_i/Y_0) \times 100$	$(Y_i/Y_{i-1}) \times 100$	$[(Y_i/Y_0) \times 100] - 100$	$[(Y_i/Y_{i-1}) \times 100] - 100$		
2014	12 054,80								
2015	11 910,10	-144,70	-144,70	98,80	98,80	-1,20	-1,20	120,548	120,548
2016	10 897,80	-1 157,00	-1 012,30	90,18	91,50	-9,82	-8,50	119,101	119,101
2017	8 413,10	-3 641,70	-2 484,70	69,62	77,20	-30,38	-22,80	108,978	108,978
2018	7 798,90	-4 255,90	-614,20	64,53	92,70	-35,47	-7,30	84,131	84,131
2019	6 527,70	-5 527,10	-1 271,20	54,02	83,70	-45,98	-16,30	77,989	77,989
2020	5 666,00	-6 388,80	-861,70	46,89	86,80	-53,11	-13,20	65,277	65,277
2021	5 564,00	-6 490,80	-102,00	46,04	98,20	-53,96	-1,80	56,66	56,66
2022	6 587,80	-5 467,00	1 023,80	54,51	118,40	-45,49	18,40	55,64	55,64
2023	6 495,60	-5 559,20	-92,20	53,75	98,60	-46,25	-1,40	65,878	65,878
2024	4075,90	-7 978,9	-2 419,7	33,81	62,75	-66,19	-37,25	64,956	64,956

Toshkent viloyati hududlarida fermer xo'jaliklari yalpi ishlab chiqarish xajmi 2024 yilda 4075,90 mlrd. so'mni tashkil etgan yoki 2014 yilga nisbatan 7978,9 mlrd.so'mga kamaygan. (1 -jadval)

“Statistikada bir omilli modellarini aniqlash usuli juft korrelyatsiya, yuqori faktorli modellarni aniqlash usuli esa yuqori omilli korrelyatsiya deyiladi.

Guruhlangan ma'lumotlar to'plami bo'yicha regressiyani to'g'ri chiziqli tenglamasini aniqlash: $Y=a_0+a_1x$ taenglama bo'yicha olib boriladi. Bu yerda a_0 - ozod had, a_1 - regressiya tenglamasining koeffitsienti, x - omil belgining qiymatlari, Y_x - natijaviy belgi alohida qiymatlari”¹⁰.

⁹ Toshkent viloyati statistika boshqarmasining 2014-2023 yillar bo'yicha ma'lumotlari asosida muallifning hisob-kitoblari.

¹⁰ Shodiyev X., Xabibullayev I., Utanov B.Q. Statistika bo'yicha praktikum: o'quv qo'llanma //.-T.: IQTISOD-MOLIYA”, 2021.-33 6.

Regressiya tenglamasini aniqlash uchun hisoblamalar jadvalini tuzamiz¹¹:

Yillar	Fermer xo'jaliklarida etishtirilgan don va dukkakli don ekinlarning o'rtacha hosildorligi, ts/ga (Y)	1 ta fermerga to'g'ri keladigan yer maydoni, gektar (X)	xy	x ²	$Y_x = 24,8663 + 1,1387x$
2014	45,9	19	45,9	361	46,5
2015	44,4	17,9	44,4	320,41	45,2
2016	41,8	10,3	41,8	106,09	36,6
2017	34,8	8,5	34,8	72,25	34,5
2018	32,6	8,6	32,6	73,96	34,7
2019	45,6	13,5	45,6	182,25	40,2
2020	37,8	10,8	37,8	116,64	37,2
2021	34,8	10,2	34,8	104,04	36,5
2022	38,8	12	38,8	144	38,5
2023	36,9	13,4	36,9	179,56	40,1
2024	37,2	13,8	37,2	190,44	40,6
Jami:	430,6	138	430,6	1850,6	430,6
O'rtacha:	39,1	12,5	39,1	168,2	39,1

a_0 va a_1 parametrlari quyidagi normal chiziqli tenglamalar tizimidan kelib chiqadi:

$$n a_0 + a_1 \sum x = \sum y$$

$$a_0 \sum x + a_1 \sum x^2 = \sum yx$$

Tizimning parametrlariga nisbatan umumiy echimi ushbu ko'rinishda yoziladi:

$$a_1 = \frac{\overline{xy} - \bar{x} \cdot \bar{y}}{\overline{x^2} - (\bar{x})^2} = \frac{502,3 - 12,5 \cdot 39,1}{168,2 - 12,5^2} = 1,1387$$

$$a_0 = \bar{y} - a_1 \bar{x} = 39,1 - 1,1387 \cdot 12,5 = 24,8663$$

fermer xo'jaliklarida yetishtirilgan don va dukkakli don ekinlarning o'rtacha hosildorligi va 1 ta fermerga to'g'ri keladigan yer maydoni o'rtasidagi bog'lanish chiziqli bo'lib, qo'yidagi tasosiylama bilan ifodalanadi.

$$\bar{y}_x = a_0 + a_1 x$$

bu erda: Y_x - fermer xo'jaliklarida yetishtirilgan don va dukkakli don ekinlarning o'rtacha hosildorligi, ts/ga.

x - 1 ta fermerga to'g'ri keladigan yer maydoni, gektar.

a_0 va a_1 - regressiya tenglamasi parametrlari.

¹¹ Toshkent viloyati statistika boshqarmasining 2014-2022 yillar bo'yicha ma'lumotlari asosida muallifning hisob-kitoblarfi.

3-jadval ma'lumotlaridan ko'rishimiz mumkinki, regressiya tasosiylamasini parametrlari aniqlangandan so'ng Y_x regressiyaning nazariy yo'nalishi X qiymatlarini korrelyatsiya tasosiylamasida aloqasi aniqlandi.

Tenglama parametrlari to'g'ri aniqlanganda $\sum Y = \sum Y_x$ tenglik o'rinli bo'ladi.

Regressiya koeffitsienti a_1 – omil (X) va natijaviy (Y) belgilar o'rtasidagi bog'lanishni aniqlaydi. X - omil belgi bir birlikka o'zgarganda (o'sganda) Y - natijaviy belgi necha birlikka o'zgarishini ko'rsatadi. Demak, ushbu 1 ta fermerga to'g'ri keladigan yer maydoni ining 1 gektariga 0,35 ts/ga oshadi. Ushbu jadval ma'lumotlaridan foydalangan tarzda grafisini yasaymiz. (3-jadval)

Xulosa qilib aytganda, iqtisodiyotning tarmoqlariga ilg'or xorijiy tajribalari statistik tadqiq etilmagan, yetishtirilgan don va dukkakli don ekinlarning o'rtacha hosildorligining ilmiy-uslubiy asoslarini statistik o'rganish, barqaror rivojlantirishning yo'nalishlarini, kelgusidagi rivojlanish strategiyalarini ishlab chiqish, iqtisodiy samaradorlikni oshirish omillarini baholash, raqobatchilik muhitini statistik tadqiq etish, ularda aniqlangan mavjud muammolarini hal etish yo'llarini ilmiy jihatdan asoslab berish, ularni rivojlantirish parametrlarini statistik baholash kabi muammolarni hal qilish muhim ahamiyat kasb etadi.

Toshkent viloyatida fermer xo'jaliklari faoliyati barqaror o'sib borayotgani kuzatilmoqda. Ekin maydonlari, hosildorlik va chorvachilik mahsulotlari hajmining o'sishi qishloq xo'jaligi ishlab chiqarishining samaradorligini ko'rsatmoqda.

Biroq ayrim muammolar ham mavjud:

- Suv resurslaridan samarali foydalanish masalalari;
- Qishloq xo'jaligi texnikasi va texnologiyalarining yetarli emasligi;
- Mahsulotlarni qayta ishlash va eksport qilish imkoniyatlarining cheklanganligi;
- Fermer xo'jaliklarida kadrlar malakasining pastligi.

Shu bois davlat tomonidan qo'llab-quvvatlash, subsidiyalar va ilmiy tadqiqotlarga asoslangan agrotexnologiyalarni keng joriy etish muhim ahamiyat kasb etadi.

Xulosa

Toshkent viloyati fermer xo'jaliklarida mahsulot (ish, xizmatlar) yetishtirish jarayonlarini statistik baholash ularning iqtisodiy holatini chuqur tahlil qilish imkonini beradi. Tadqiqot natijalari fermer xo'jaliklarida ishlab chiqarish samaradorligini oshirish, xarajatlarni optimallashtirish va raqobatbardoshlikni kuchaytirishga xizmat qiladi. Statistik tahlil natijalaridan qishloq xo'jaligini rivojlantirish bo'yicha strategik qarorlar qabul qilishda keng foydalanish maqsadga muvofiqdir. Tahlil natijalariga ko'ra, Toshkent viloyati fermer xo'jaliklari qishloq xo'jaligi rivojlanishining muhim bo'g'ini sifatida barqaror o'sib bormoqda. Fermer xo'jaliklarining samaradorligini yanada oshirish uchun quyidagi takliflarni ilgari surish mumkin:

1. Fermer xo'jaliklarida ishlab chiqarilgan mahsulot hajmi yalpi va tovar mahsuloti ko'rsatkichlari orqali baholanadi. Toshkent viloyatida yetishtirilayotgan asosiy qishloq xo'jaligi mahsulotlariga don, sabzavot-poliz, meva-sabzavot hamda

chorvachilik mahsulotlari kiradi. Statistika tahlil ishlab chiqarish hajmining yillar bo'yicha o'sish yoki kamayish tendensiyalarini aniqlash imkonini beradi.

2. Mehnat unumdorligi fermer xo'jaliklarida samaradorlikni belgilovchi muhim ko'rsatkich hisoblanadi. U bir ishchiga to'g'ri keladigan ishlab chiqarilgan mahsulot hajmi yoki tushum orqali aniqlanadi. Mehnat unumdorligining oshishi ishlab chiqarish texnologiyalarining takomillashuvi va resurslardan oqilona foydalanish bilan bog'liq.

3. Mahsulot tannarxi fermer xo'jaliklari raqobatbardoshligini belgilovchi asosiy omillardan biridir. Statistika baholashda urug'lik, yoqilg'i, o'g'it, ish haqi va boshqa xarajatlarning umumiy tannarxdagi ulushi aniqlanadi. Xarajatlar tarkibini tahlil qilish ularni kamaytirish imkoniyatlarini ochib beradi.

4. Fermer xo'jaliklari faoliyatining yakuniy samarasi foyda va rentabellik ko'rsatkichlari orqali baholanadi. Rentabellik darajasi ishlab chiqarish xarajatlariga nisbatan olingan foyda bilan aniqlanadi. Toshkent viloyatida faoliyat yuritayotgan fermer xo'jaliklarida rentabellik darajasining o'zgarishi bozor sharoiti va mahsulot narxlariga bevosita ta'sirini statistik baholash imkonini beradi.

Umuman olganda, *Toshkent viloyati* fermer xo'jaliklarida mahsulot (ish, xizmatlar) yetishtirish jarayonlarini statistik baholash, muammolarni aniqlash va samarali yechimlarni ishlab chiqishda muhim ahamiyat kasb etadi. Toshkent viloyatidagi fermer xo'jaliklarining barqaror rivojlanishi respublikamiz oziq-ovqat xavfsizligini ta'minlashda muhim omil bo'lib xizmat qiladi.

Adabiyotlar:

1. O'zbekiston Respublikasi Prezidentining 2023-yil 11-sentabrdagi "O'zbekiston — 2030" strategiyasi to'g'risida" gi PF-158-sonli Farmoni. <https://lex.uz/uz/docs/-6600413>.
2. O'zbekiston Respublikasining "Rasmiy statistika to'g'risida" gi O'RQ - 707 – sonli qonuni. 2021 yil. 11 avgust. . www.lex.uz.
3. N. M. Soatov, N.G'. Nabiyev, A.H. Ayubjonov. Amaliy statistika. Darslik. Toshkent-2020 yil.
4. Shodiyev X. va Xabibullayev I. Statistika: darslik //. – T.: "IQTISOD-MOLIYA", 2019 yil.
5. Esanov E., Bebutova Z. Kompakt to'plamda ko'lchami birga teng qatlamalar //Евразийский журнал академических исследований. – 2023. – Т. 3. – №. 12 Part 2. – С. 72-80.
6. Hamidovna B.Z. Silliq ko'p xilliklarning ba'zi tatbiqlari // international journal of recently scientific researcher's theory. – 2023. – Т. 1. – №. 9. – С. 73-77.
7. Hamidovna B.Z. Introduction of the first great limit // Ethiopian International Journal of Multidisciplinary Research. – 2023. – Т. 10. – №. 08. – С. 1-8.
8. Fermer xo'jaliklari tomonidan ishlab chiqarilgan mahsulot (xizmat)larning statistik tahlili/ Moliyaviy texnologiyalar ilmiy elektron jurnali. /3-son/ <http://fintech.tfi.uz/> [1]
9. Fermer xo'jaliklarida mahsulot (xizmat)larni ishlab chiqarishda xorijiy tajribalaridan foydalanish/ Moliyaviy texnologiyalar ilmiy elektron jurnali. /4-son/ <http://fintech.tsue.uz/>

10. Toshkent viloyati statistika boshqarmasining 2020-2024-yillar bo'yicha ma'lumotlari.

11. www.stat.uz - O'zbekiston Respublikasi Milliy statistika qo'mitasi ma'lumotlari.

DEVELOPMENT OF A MECHATRONIC SYSTEM FOR SELECTING WATER TEMPERATURE IN SILK REELING PROCESS

Abstract: *Water temperature is one of the most critical parameters affecting silk filament quality and productivity during the silk reeling process. Improper temperature control leads to frequent thread breakage, reduced filament length, and lower production efficiency. This paper presents the development of a mechatronic system for optimal water temperature selection and control in silk reeling. The proposed system integrates temperature sensors, a controller, and power control elements to maintain stable technological conditions. Experimental and analytical considerations show that the application of a mechatronic approach significantly improves silk quality, process stability, and energy efficiency.*

Keywords: *silk reeling, water temperature control, mechatronic system, automation, sericulture.*

1. Introduction

Silk reeling is a key stage in silk production where continuous silk filament is unwound from cocoons. Among various technological parameters, **water temperature** plays a decisive role in softening sericin and enabling smooth filament extraction. Traditional silk reeling systems rely heavily on manual control, which results in unstable temperature conditions and inconsistent product quality.

With the increasing demand for high-quality and competitive silk products, the introduction of **mechatronic systems** has become essential. Mechatronics combines mechanics, electronics, sensors, and intelligent control to achieve automated and optimized industrial processes. This study focuses on developing a mechatronic system for selecting and maintaining optimal water temperature in silk reeling operations.

2. Role of Water Temperature in Silk Reeling

Water temperature directly influences:

- Softening of sericin;
- Continuity and uniformity of silk filament;
- Thread breakage rate;
- Energy consumption of the reeling process.

Typically, the optimal temperature range for silk reeling lies between **60 °C and 90 °C**, depending on cocoon quality and reeling conditions. Deviations from this range negatively affect both **silk quality and productivity**, making precise temperature control essential.

3. Mechatronic System Structure

3.1 System Components

The proposed mechatronic system consists of the following main elements:

- **Water Temperature Sensor**

Measures real-time water temperature in the reeling bath with high accuracy.

- **Controller (Microcontroller or PLC)**

Processes sensor data, compares it with preset reference values, and generates control signals.

- **Pump / Power Control Element**

Regulates heating power and water circulation based on controller commands.

- **Silk Reeling Process Unit**

The technological process where silk filament is extracted under controlled conditions.

3.2 Working Principle

1. The temperature sensor continuously monitors water temperature.
2. The measured signal is transmitted to the controller.
3. The controller compares the actual temperature with the optimal setpoint.
4. Control commands are sent to the power control element.
5. Heating intensity or water flow is adjusted automatically.
6. A **closed-loop control system** ensures stable temperature during the entire reeling process.

4. Advantages of the Proposed Mechatronic System

The implementation of the mechatronic temperature control system provides several advantages:

- Improved silk filament uniformity and strength;
- Reduced thread breakage;
- Increased production efficiency;
- Lower energy consumption;
- Reduced dependence on manual operation;
- Real-time monitoring and adaptive control.

5. Discussion

Compared with conventional manual control methods, the proposed system ensures **higher process stability and repeatability**. The integration of sensors and intelligent controllers enables rapid response to temperature fluctuations, which is critical for maintaining silk quality. Moreover, the system can be expanded by incorporating additional sensors (such as ultrasonic frequency or tension sensors) for advanced process optimization.

6. Conclusion

This study demonstrates that the development of a **mechatronic system for selecting and controlling water temperature in silk reeling** significantly enhances both quality and efficiency. Automated temperature regulation ensures optimal technological conditions, reduces production losses, and meets modern industrial requirements. The proposed system can be effectively applied in industrial silk reeling machines and serves as a foundation for further intelligent automation in the sericulture industry.

References

1. Choudhury, A. K. R. (2014). Principles of Textile Finishing. Woodhead Publishing, Cambridge.
2. Rajan, R. K., & Himantharaj, M. T. (2005). Silk reeling technology and quality control. Indian Journal of Fibre & Textile Research, 30(2), 99–105.
3. Gulrajani, M. L. (2009). Sericulture and Silk Technology. Oxford & IBH Publishing Co., New Delhi.
4. Datta, R. K. (2000). Mulberry cultivation and silk production. FAO Agricultural Services Bulletin, No. 73.
5. Lawrence, C. A. (2010). Advances in Silk Science and Technology. Woodhead Publishing, UK.
6. Bolton, W. (2015). Mechatronics: Electronic Control Systems in Mechanical and Electrical Engineering. Pearson Education.
7. Dorf, R. C., & Bishop, R. H. (2017). Modern Control Systems. Pearson Education.
8. Nakamura, S., & Sakai, K. (2012). Effect of water temperature on silk filament properties during reeling. Journal of Textile Engineering, 58(4), 145–151.
9. IEC 61131-3 (2013). Programmable Controllers – Programming Languages. International Electrotechnical Commission.
10. ISO 9001:2015. Quality Management Systems – Requirements. International Organization for Standardization.
11. Ўзбекистон Республикаси Қишлоқ хўжалиги вазирлиги. *Ипакчилик соҳасини ривожлантириш бўйича меъёрий ҳужжатлар*. Тошкент.
12. Ахмаджонов, Ш., & Ботиров, А. (2022). Ипак чувиш жараёнида технологик параметрларни оптималлаштириш. *Ўзбекистон техника журнали*, 4, 45–50.

DEVELOPMENT OF ULTRASONIC TECHNOLOGY USING MECHATRONIC SYSTEMS IN THE COCOON REELING PROCESS

Abstract: *This article discusses the application of ultrasonic technology in silk production, which enables acceleration of the silk extraction process and obtaining high-quality silk by rapidly decomposing sericin. The use of mechatronic systems allows automation of the production process and increases efficiency through precise control of water temperature and ultrasonic power.*

Keywords: *mechatronic systems, sericin softening, energy efficiency, automated control, production efficiency, silk quality, low-temperature processing, advanced technologies.*

Introduction

In the cocoon reeling process, several important parameters significantly affect process efficiency. These include water temperature, reeling speed, and the frequency and power of ultrasonic воздействия. Proper selection of these parameters makes it possible to convert cocoons into silk threads quickly and efficiently.

Water temperature plays a crucial role in the reeling process. The optimal temperature range is 35–40 °C. At higher temperatures, sericin softens more rapidly, facilitating easier separation of silk fibers. This process can be mathematically expressed by the following equation:

$$R_s = k_1 \cdot T_s^n \quad (1)$$

where:

R_s — sericin softening rate,

T_s — water temperature,

k_1 and n — experimental coefficients defining the effect of temperature on sericin.

As water temperature increases, T_s rises, leading to an increase in the sericin softening rate (R_s). Higher temperatures therefore help soften the cocoon more quickly.

Reeling Speed

Reeling speed also has a significant impact on process efficiency. A speed of **178–182 m/min** is considered optimal for the technological process. As speed increases, the softening of sericin and the separation of silk fibers accelerate. This relationship can be expressed by the following equation:

$$V_c = k_2 \cdot \frac{1}{T_s} \quad (2)$$

where:

• V_c — reeling speed,

- T_s — water temperature,
- k_2 — coefficient describing the relationship between water temperature and reeling speed.

At high reeling speeds with low water temperature, efficiency decreases because sericin does not fully soften.

Frequency and Power of Ultrasonic Action

The frequency and power of ultrasonic exposure cause molecular-level vibrations, which accelerate the softening of sericin and facilitate silk fiber separation. The energy of ultrasonic influence can be expressed mathematically as:

$$E_u = k_3 \cdot f \cdot P_u \quad (3)$$

where:

- E_u — ultrasonic energy,
- f — ultrasonic frequency,
- P_u — ultrasonic power,
- k_3 — coefficient influencing energy transfer.

As frequency and power increase, ultrasonic energy also increases, accelerating the sericin softening process in the cocoon.

In the cocoon reeling process, parameters such as water temperature, reeling speed, and ultrasonic frequency and power are of great importance. Optimization of these parameters using mathematical models enables increased process efficiency and improved energy savings.

Mechatronic System Scheme

The application of mechatronic systems is essential for the automatic control of the cocoon reeling process in silk production.

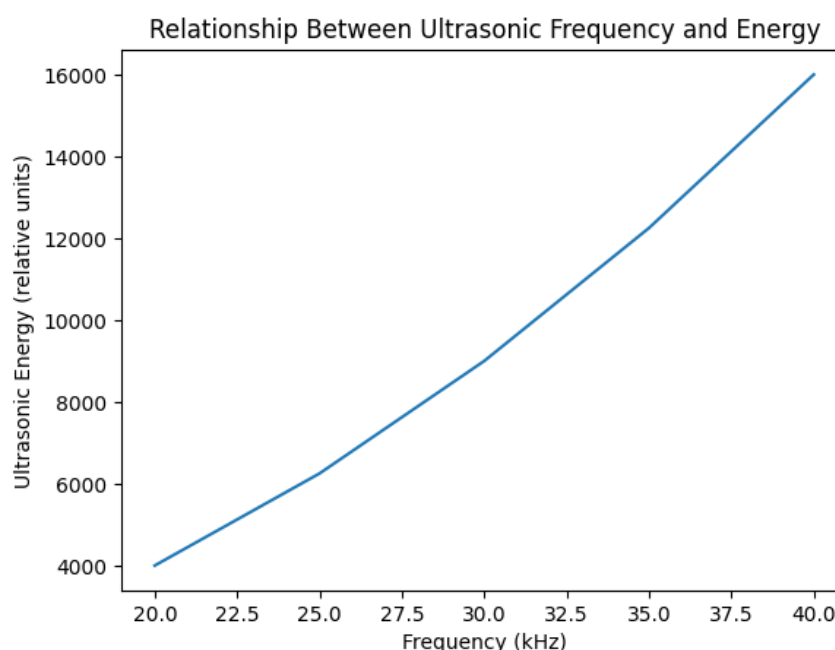


Figure 1. Simplified scheme of the Ultrasonic Frequency and Energy

Such systems precisely and efficiently control water temperature, ultrasonic frequency and power, as well as reeling speed. They enable automation and optimization of the process, which positively affects both energy efficiency and product quality.

Conclusion

The proposed scheme illustrates the operating principle of the mechatronic system: water temperature and ultrasonic frequency sensors transmit data to the controller. Based on this data, the controller manages the process through pumps and power control elements. The system continuously monitors water temperature and ultrasonic frequency, ensuring high efficiency of the reeling process.

References

1. Khusanboev, A. M., Botirov, A. A. U., & Abdullaeva, D. T. (2019). *Development of a prismatic elbow*. Problems of Modern Science and Education, 11-2(144), 21–23.
2. Usmanov, J. A., Umarova, M. O., Abdullaeva, D. T., & Botirov, A. A. U. (2019). *Investigation of the efficiency of cleaning raw cotton from fine impurities*. Problems of Modern Science and Education, 11-1(144), 48–51.
3. Botirov, A. A. U., & Turgunbekov, A. M. U. (2021). *Investigation of productivity and accuracy of processing in the manufacture of shaping equipment*. Oriental Renaissance: Innovative, Educational, Natural and Social Sciences, 1(11), 435–449.
4. Valikhonov, D. A. U., Botirov, A. A. U., Okhunjonov, Z. N., & Karimov, R. K. (2021). *Recycling of old asphalt concrete*. Scientific Progress, 2(1), 367–373.

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TERMIZ SHAROITIDA ROSMARINUS OFFICINALIS L. O'SISHI VA RIVOJLANISHINING EKOLOGIK ASOSLARI

Annotatsiya. Mazkur maqolada *Rosmarinus officinalis* L. (rozmarin) o'simligining ekologik moslashuvchanligi, stressga chidamlilik xususiyatlari va farmakologik qiymati ilmiy manbalar asosida tahlil qilinadi. Termiz vohasining agroiklim sharoitlari rozmarinning tabiiy ekologik talablari bilan solishtiriladi. Ilmiy adabiyotlar sharhi, ekologik parametrlar, metabolik jarayonlar va bioaktiv moddalar to'planishi o'rtasidagi bog'liqlik asosida Termizda rozmarin yetishtirishning nazariy asoslangan istiqbollari yoritiladi.

Kalit so'zlar: *Rosmarinus officinalis*, efir moy, ekologik moslashuvchanlik, issiqlik stressi, farmakologiya, bioaktiv birikmalar, Termiz iqlimi.

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ECOLOGICAL PRINCIPLES OF GROWTH AND DEVELOPMENT OF ROSMARINUS OFFICINALIS L. IN THE CONDITIONS OF TERMIZ

Abstract. This article analyzes the ecological adaptability, stress tolerance properties and pharmacological value of *Rosmarinus officinalis* L. (rosemary) based on scientific sources. The agroclimatic conditions of the Termez oasis are compared with the natural ecological requirements of rosemary. Based on a review of scientific literature, the relationship between ecological parameters, metabolic processes and the accumulation of bioactive substances, theoretically based prospects for rosemary cultivation in Termez are highlighted.

Keywords: *Rosmarinus officinalis*, essential oil, ecological adaptability, heat stress, pharmacology, bioactive compounds, Termez climate.

Kirish. O'zbekiston Respublikasida ham dorivor o'simliklarni ko'paytirish va tabiiy holatda o'sadigan dorivor o'simliklarning zaxiralarini aniqlash hamda ularni mahalliy sharoitga moslashtirish ustida ilmiy-amaliy ishlar olib borilmoqda. O'zbekiston Respublikasi Prezidenti Shavkat Mirziyayevning 2022 yil 20-maydagi "Dorivor o'simliklar xom-ashyo bazasidan samarali foydalanish, qayta

ishlashni qo'llab-quvvatlash orqali qo'shimcha qiymat zanjirini yaratish chora-tadbirlari to'g'risida"gi PF 139-son farmonida keltirilgan dorivor o'simliklar qatorida rozmarin o'simligining xom – ashyo bazasini shakllantirish ham ustuvor vazifa sifatida berilgan. Ilmiy izlanishlarimizda rejalashtirilgan tadqiqotlar dorivor *Rosmarinus officinalis* L.ning oziq- ovqat, farmasevtika va kosmetika sanoatida muhim ahamiyatga ega ekanligi nazarda tutilsa, bu o'simlikni Surxondaryo iqlim va tuproq sharoitida o'sishi va rivojlanishi, ontogenez bosqichlarini o'rganish dolzarb vazifadir.(1)

Rosmarinus officinalis L. (Rozmarin) — bu Lamiaceae (Yalpizdoshlar) oilasiga mansub, o'ziga xos xushbo'y hidga ega bo'lgan, ko'p yillik butasimon o'simlikdir. Ko'p yillik doimiy yashil buta. Bo'yi (Poyasi) Tik o'suvchi shakllari odatda 1.2–1.8 metr (ayrim manbalarda 1 m gacha) balandlikka yetishi mumkin. Barglari doim yashil, 2–4 sm uzunlikda va 2–5 mm kenglikda. Igna shaklida, bandsiz (sessil) yoki qisqa bandli, terisimon, usti to'q yashil, osti esa oq-jundor va g'adir-budur (tomentoz) bo'ladi. Chetlari ichkariga qayrilgan. O'ziga xos xushbo'y hidga ega. Gullari kichik, ikki labli, binafsha, och binafsha, ko'k yoki oq rangda bo'ladi. Bahor va yoz faslida (mo'tadil iqlimda) gullaydi, iliq iqlimda esa doimiy ravishda gullashi mumkin. Poyasi (Novdalari) Zich shoxlangan buta shaklida. Rozmarin butasi yetarli parvarish va mos sharoitlarda 20-25 yilgacha, hatto ayrim manbalarga ko'ra 35 yilgacha ham umr ko'rishi va hosil berishi mumkin. Uning vatani O'rta yer dengizi mintaqasidagi mo'tadil mamlakatlar, masalan, Portugaliya. Rozmarin qurg'oqchilikka chidamli bo'lgani uchun asosan O'rta yer dengizi iqlimi bo'lgan hududlarda manzarali o'simlik sifatida va kseroskopik (suvni tejaydigan) landshaftlarda ekiladi. U o'stirish uchun oson, zararkunandalarga chidamli hisoblanadi. Namlikni yaxshi ko'rmaydi, quyoshli joylarni va yaxshi drenajlangan tuproqni talab qiladi. (2)

Rozmarin (*Rosmarinus officinalis* L.) tabiiy holda O'rta yer dengizi iqlimiga mansub bo'lganligi sababli, uning stressga chidamliligi (ayniqsa, Termiz kabi issiq va quruq sharoitlarda) juda **yuqori** hisoblanadi. Rozmarinning stresga chidamliligi asosan quyidagi omillar orqali namoyon bo'ladi. Rozmarinning eng muhim moslashuv xususiyatlaridan biri uning qurg'oqchilikka chidamliligidir. Barglari qalin, ignasimon shaklda bo'lib, sirt yuzasi kichik. Bu bug'lanish tezligini sezilarli darajada kamaytiradi. Barglari usti qalin mumsimon qatlami bilan qoplangan bo'lib, bu suv yo'qotilishini minimallashtiradi. Barglarning pastki qismida joylashgan zich, oqish tukchalar (trixomalar) yorug'likni qaytaradi va barg atrofida namlikni ushlab turuvchi mikro-muhit yaratib, suv yo'qotilishini pasaytiradi. Uning ildizlari chuqur va keng tarqalgan bo'lib, tuproqning chuqur qatlamlaridan ham namlikni samarali o'zlashtira oladi. Yuqori harorat va quyosh nuriga chidamlilik: Rozmarin to'g'ridan-to'g'ri va kuchli quyosh nurini talab qilishi va -5°C dan -10°C gacha bo'lgan qisqa muddatli sovuqlarga bardosh bera olish jihati Termiz sharoitida bu o'simlikni plantatsiyalarini yaratish istiqbollidir. (4)

Rozmarin (*Rosmarinus officinalis*) o'simligi nafaqat oshxonada ziravor sifatida, balki sanoatning turli sohalarida ham juda qimmatli xomashyo hisoblanadi.

Uning asosiy qiymati tarkibidagi efir moylari, antioksidantlar (ayniqsa, karnos kislotasi va rozmarin kislotasi) hamda biologik faol birikmalarga borib taqaladi.

Efir moylarini o'zida mujassam etgan dorivor o'simliklarning 300 xilga yaqini dunyoning turli xil mintaqalarida o'sishi kuzatilgan. Ma'lumki, efir moylari o'simlikning ildizida, poya – barglarida, gul– urug' va mevalarida turli miqdorda to'planadi. Efir moylari uchuvchan xususiyatga ega bo'lib o'ziga xos yoqimli, yoqimsiz xatto badbo'y xid chiqaradi. Bunday moylar og'riq qoldirishi, a'zolarini qizdirishi va shu bilan birga qon bosimini pasaytirishi mumkin. Efir moyi o'z tarkibida 50% pinen, kamfen, sineol, barneol va kamfora saqlanganligi sababli ulardan parfyumeria sanoatida, dorivor va insektatsiya preparatlari tayyorlashda foydalaniladi. O'simlikning yer ustki barglari va yosh poyalaridan tayyorlangan damlama va spirtidagi eritmaları bosh og'rig'i, oshqozon – ichak kasalliklari, shamollashda, ayollarda uchraydigan ayrim kasalliklarni davolashda ijobiy foyda beradi. Shu bilan birga organizmni tetiklashtirib, quvvat bag'ishlash kabi xususiyatiga ham ega. Barglarida o'ziga xos xid va ta'm berganligi sababli rozmarin go'shtli mahsulotlarni pishirishda va ularni uzoq muddat saqlashda ziravor sifatida ham foydalaniladi. Konditer mahsulotlariga qo'shib tayyorlanganda o'ziga xos ta'm va maza beradi. O'simlik qish mavsumida ham barglarini to'kmasligi va o'ziga xoshid tarqatib turishini hisobga olgan holda u park va xiyobonlar, hovli va istirohatgohlarda ko'rkam buta sifatida parvarish qilinadi. (3)

Rozmarin efir moyi kosmetika va parfyumeriya sohasida eng ko'p ishlatiladigan xomashyolardan biridir. Soch parvarishida: shampunlar, konditsionerlar va soch toniklarida qo'llaniladi. U bosh terisida qon aylanishini yaxshilash, soch to'kilishini kamaytirish va kepekka qarshi kurashish xususiyatlariga ega. Stressni kamaytirish, diqqatni jamlashni kuchaytirish va charchoqni yo'qotish uchun mo'ljallangan aromaterapiya mahsulotlari (difuzor moylari) ishlab chiqariladi. (5) Farmatsevtika va Tibbiyot Sanoatida Rozmarinning terapevtik xususiyatlari uni dori vositalari va biologik faol qo'shimchalar (BAD) ishlab chiqarishda qimmatli qiladi. Yallig'lanishga qarshi dorilarda rozmarin ekstraktlari artrit va mushak og'riqlarini kamaytirish uchun tashqi va ichki dori vositalarining tarkibiy qismi sifatida o'rganilmoqda. Uning kuchli antibakterial xususiyatlari og'iz bo'shlig'ini parvarish qilish vositalari va antiseptik eritmalar tarkibida ishlatiladi. (6) Oziq-ovqat sanoatida esa rozmarin eng kuchli tabiiy antioksidantlardan biri bo'lgani uchun u sintezlangan kimyoviy konservantlarga tabiiy muqobil sifatida xizmat qiladi.

Xulosa. Olib borilgan tadqiqotlar Termizning keskin kontinental iqlim sharoitlari (*Rosmarinus officinalis* L.) ning istiqbolli introduksiyasi va yetishtirilishi uchun ekologik jihatdan qulay muhit ekanligini ko'rsatadi. Kuchli quyosh radiatsiyasi, yozning issiq va quruq kelishi o'simlikda efir moylari, ayniqsa rozmarin kislotasi va karnosol kabi asosiy antioksidantlarning sintezini sezilarli darajada kuchaytirib, xom ashyoning farmakologik qiymatini oshiradi. Termiz sharoitida esa yetishtirilgan rozmarin (*Rosmarinus officinalis* L.)da antibakterial va antioksidant xususiyatlarning yanada ortishi, farmatsevtika va oziq-ovqat sanoatiga yuqori sifatli, eksport xomashyo bazasini yetkazib berish deganidir.

Foydalanilgan adabiyotlar

1. O'zbekiston Respublikasi Prezidenti Shavkat Mirziyayevning 2022-yil 20-maydagi "Dorivor o'simliklar xom-ashyo bazasidan samarali foydalanish, qayta ishlashni qo'llab-quvvatlash orqali qo'shimcha qiymat zanjirini yaratish chora-tadbirlari to'g'risida"gi PF 139-son farmoni.
2. Alonso, A. G., et al. . Anatomical and morphological adaptations of *Rosmarinus officinalis* L. under water deficit stress. *Environmental and Experimental Botany*, 47(3), 221-230. 2002-y
3. Ibragimov A.YO. Dorivor va ziravor o'simliklar. Toshkent, 2005y
4. Normatov, Sh. B., & Xolmatov, G. K. Surxondaryo viloyatining tuproq-iqlim sharoitlari va ularda dorivor o'simliklar yetishtirishning agrotexnik asoslari. *O'zbekiston Qishloq Xo'jaligi Jurnali*, 5(2), 45-50. 2017-y
5. Panahi, Y., et al. *Archives of Dermatology Research* (Springer) . Efficacy of topical rosemary oil in treating androgenetic alopecia compared with minoxidil. 2015-y
6. Togashi, S. A., et al. *Food Reviews International* (Taylor & Francis). Rosemary essential oil: Composition, antimicrobial and antioxidant activities, and applications in food preservation. 2018-y

MECHANISMS OF SOCIAL CONTROL IN FORMING A SENSE OF RESILIENCE AMONG YOUTH IN UZBEKISTAN

Annotation: *This article examines the composition of the Society for the Promotion of Public Control in Uzbekistan, as an important factor in strengthening the spiritual and moral resilience of young people, ensuring the development, security, and spiritual sovereignty of the state.*

Key words: *Public organizations, society and youth, the moral and ethical resilience of young people, and youth consciousness.*

The formation of resilience to social, political, and ideological threats among today's youth in Uzbekistan is closely connected with the democratic reforms consistently implemented in recent years. These reforms, aimed at building a New Uzbekistan, play a crucial role in shaping youth consciousness, civic responsibility, and moral stability. In modern conditions of globalization and rapid information flow, young people face various ideological risks that require effective social and institutional mechanisms for protection.

In this context, public oversight has emerged as one of the most important instruments for strengthening democracy, ensuring transparency, and fostering youth resilience. Through active participation of citizens and civil society institutions, public oversight contributes to the development of legal awareness, political culture, and social responsibility among young people.

Democratic development in Uzbekistan is based on the principles of rule of law, accountability, transparency, and public participation. These principles require state bodies and officials at all levels to strictly comply with the law and respect citizens' rights. Raising political and legal awareness among the population, especially youth, has therefore become a priority direction of state policy.

The consistent implementation of democratic reforms enhances youth confidence in state institutions and encourages their active involvement in social and political life. As young people gain opportunities to participate in decision-making processes, they develop a stronger sense of responsibility for the future of the country. This process directly influences the formation of resilience to ideological threats, social instability, and external pressures.

At the same time, expanding the rights and activities of nongovernmental organizations and public associations has strengthened civil society. These institutions serve as a bridge between the state and citizens, ensuring that public interests are reflected in governance and that youth voices are heard.

Public oversight represents a form of genuine popular control over state power. Its effectiveness lies in identifying social problems, eliminating

shortcomings in governance, and ensuring that state institutions operate in the interests of society. In Uzbekistan, public oversight has deep historical roots, traditionally manifested through institutions such as Councils of Elders, which promoted social harmony, moral values, and collective responsibility.

Modern reforms have institutionalized public oversight through legal frameworks, most notably the Law of the Republic of Uzbekistan “On Public Oversight” adopted in 2018. This law established mechanisms that enable civil society institutions to monitor government activities, ensure transparency, and incorporate public opinion into decision-making processes.

Through these mechanisms, public oversight strengthens trust between the state and society, reduces alienation, and encourages youth participation in governance. Young people who engage in public oversight activities develop critical thinking skills, legal awareness, and a sense of civic duty, which are essential components of resilience.

Civil society institutions, including nongovernmental organizations, community structures, and political parties, play a vital role in building a democratic society. While political parties aim to represent the interests of specific social groups, their activities contribute to political pluralism and healthy competition within the framework of the rule of law.

In Uzbekistan, strengthening the role of civil society institutions has become a key direction of democratic reform. These institutions contribute to educating youth, promoting moral and ethical values, and protecting young people from destructive ideological influences. Cooperation between state bodies and civil society organizations enhances the effectiveness of reforms and supports the gradual transition from a strong state to a strong civil society.

The rapid development of information technologies, social networks, and global communication platforms has significantly influenced youth consciousness. Alongside positive opportunities, these processes also create risks related to ideological manipulation, misinformation, and moral degradation. Young people are particularly vulnerable to such threats due to their active engagement in digital environments.

In this context, strengthening ideological immunity and critical thinking among youth has become strategically important. Public oversight mechanisms contribute to this process by promoting openness, transparency, and civic engagement. By involving youth in social and political activities, these mechanisms help them develop the ability to critically evaluate information and resist harmful influences.

The experience of democratic reforms in Uzbekistan demonstrates that public oversight serves as an effective tool for enhancing social stability and youth resilience. As public participation increases, citizens develop a stronger sense of ownership over social processes and greater trust in state institutions. This, in turn, reduces dependency attitudes and fosters active citizenship.

However, certain challenges remain, including administrative habits, uneven implementation of laws, and limited effectiveness of media oversight. Addressing

these issues requires continued reforms, support for youth organizations, and the expansion of public oversight practices. Ensuring continuity and consistency in democratic development remains essential.

In conclusion, building a strong civil society in Uzbekistan requires sustained democratic reforms, effective public oversight, and active youth participation. Youth resilience represents a key factor in ensuring national development, social stability, and spiritual security. Public oversight mechanisms play a crucial role in shaping moral, legal, and civic consciousness among young people, enabling them to withstand modern ideological threats.

We conclude that a high level of youth resilience directly supports sustainable development and democratic progress. Strengthening public oversight and civil society institutions therefore remains a strategic priority for the future of Uzbekistan.

THE LIST OF USED LITERATURES

1. Muminov A. Uzbekistan: Toward an Information Society. Tashkent, Turon Zamin Ziyo, 2013, p. 55.
2. Abdumalikov A. Shaping Personal Information Culture in the Context of Civil Society Development: Doctor of Philosophy (PhD) Dissertation. Tashkent, 2017. p. 29.
3. Qirg'izboev M. Formation and Development of Civil Society Institutions in Uzbekistan. PhD dissertation in Political Science. Tashkent, 2007. p. 342.
4. Forobiy, Abu Nasr. *Fozil odamlar shahri*. Toshkent: A. Qodiriy nomidagi Xalq Merosi Nashriyoti, 1993. p.112.
5. Aymatov, A. *Shaxsning atrof-muhitga estetik munosabatining falsafiy masalalari*. Toshkent, 2018. p.197.
6. Mamatqobilov, T. *Mustaqil O'zbekistonda ijtimoiy himoya siyosati*. Toshkent: TDTU, 2008. p.158.
7. Negmatova, Sh. *O'zbekistonda sog'lom raqobatning ma'naviy, axloqiy va huquqiy jihatlari*. Toshkent, 2016. p.144.

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PARAFIN UGLEVODORODLARINING IZOMERIZATSIYA REAKTSIYALARIDA VODORODNING AHAMIYATI

Annotatsiya: Izomerlanish reaksiyasi tarkibida metall bo'lgan katalizatorlarda vodorod atmosferasida olib borilish sabablari, vodorod va oraliq to'yinmagan birikmalarning katalizator yuzasida adsorbsiyasi hodisalari tahlili o'rganildi. Parafin uglevodorodlarining izomerlanish reaksiyasi tezligi uglevodorodning parsial bosimi oshishi bilan ortadi va vodorodning parsial bosimi oshishi bilan esa kamayadi. Har bir uglevodorod va katalizator uchun ushbu qiymatlarning optimal nisbati izomerizatsiya chuqurligiga va vaqt o'tishi bilan katalizatorning barqarorlikka erishilishini ta'minlaydi.

Kalit so'zlar: izomerizatsiya, gidrokreking, disproportsiylanish reaksiyasi, seolit, platina, katalizator, karbkationlar konsentratsiyasi.

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THE IMPORTANCE OF HYDROGEN IN THE ISOMERIZATION REACTIONS OF PARAFFIN HYDROCARBONS

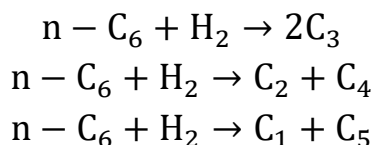
Abstract: The reasons for the isomerization reaction being carried out in a hydrogen atmosphere on a metal-containing catalyst, and the analysis of the adsorption phenomena of hydrogen and intermediate unsaturated compounds on the catalyst surface were studied. The rate of the isomerization reaction of paraffin hydrocarbons increases with increasing hydrocarbon partial pressure and decreases with increasing hydrogen partial pressure. The optimal ratio of these

values for each hydrocarbon and catalyst ensures the depth of isomerization and the stability of the catalyst over time.

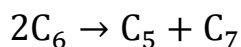
Keywords: isomerization, hydrocracking, disproportionation reaction, zeolite, platinum, catalyst, carbocation concentration.

Parafin uglevodorodlarning izomerizatsiya reaksiyalari izo-birikmalar olish manbai hisoblanadi. Bu reaksiyalar, shuningdek, neftni qayta ishlashning ayrim jarayonlarida - katalitik kreking, katalitik reforming va gidrokrekingda muhim rol o'ynaydi. Ushbu jarayonlarda n-parafinlar sezilarli darajada yuqori oktan soniga ega tarmoqlangan uglevodorodlarga izomerlanadi [1].

Parafin uglevodorodlarining izomerizatsiyasi gidrokreking va disproportsiyanish reaksiyalari bilan birga boradi. Har bir katalizator va uglevodorod uchun ushbu yon reaksiyalarni minimallashtirishda optimal sharoitlar tanlanishi kerak. N-geksan molekulasini gidrokrekingi natijasida quyidagi reaksiyalar boradi:

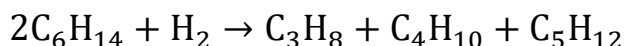


Disproportsiyanish reaksiya past va yuqori molekulyar massaga ega bo'lgan parafin uglevodorodlar hosil bo'lishi bilan sodir bo'ladi:

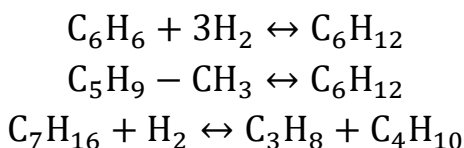


Parafin uglevodorodlarning tarkibidagi mordenitli seolit katalizatorlaridagi disproportsiyanish reaksiyasi jarayonida molekulyar og'irligi boshlang'ichga nisbatan yuqori bo'lgan uglevodorodlar reaksiya mahsulotlarida aniqlanmaydi, chunki ularning gidrokreking reaksiyasi sodir bo'ladi.

Shuning uchun vodorod muhitida seolit katalizatorida geksanlarning disproportsiyanish jami reaksiyasi quyidagicha:



Platinali katalizatorlarda izomerizatsiya jarayonida ushbu uglevodorodlar quyidagi reaksiyalar bo'yicha har bir uglevodorod uchun termodinamik muvozanat shartlariga muvofiq o'zgarishga uchraydi:



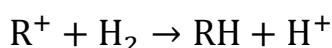
Parafin uglevodorodlarining izomerlanish reaksiyasi tezligi uglevodorodning parsial bosimi oshishi bilan ortadi va vodorodning parsial bosimi oshishi bilan esa

kamayadi. Har bir uglevodorod va katalizator uchun ushbu qiymatlarning optimal nisbati izomerizatsiya chuqurligiga va vaqt o'tishi bilan katalizatorning barqarorlikka erishilishini ta'minlaydi [2].

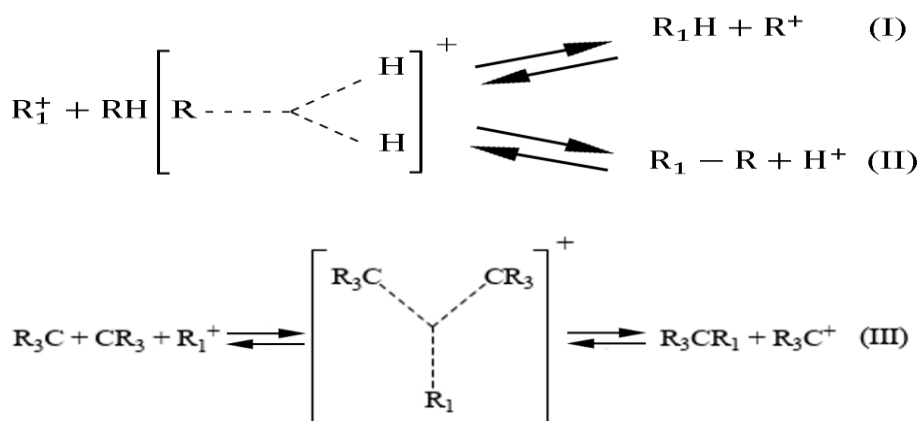
Izomerlanish reaksiyasi tarkibida metall bo'lgan katalizatorlarda uzluksiz davom etishi uchun uni vodorod atmosferasida o'tkazish kerak. Bu vodorodning adsorbsiya va dissotsiatsiya hodisalari va vodorod zarralarining metaldan tashuvchiga o'tishi bilan bog'liq [3]. Vodorod va oraliq to'yinmagan birikmalarning katalizator yuzasida adsorbsiyasi hodisalari ham sodir bo'ladi, shu bilan birga bu birikmalarning bir qismi katalizator yuzasidan vodorod bilan siqib chiqariladi, bu ham uning barqaror ishlashini ta'minlaydi.

Ftor va xlor bilan promotorlangan alyumoplatina katalizatorlarida va metall seolit katalizatorlarida reaksiya olib borilsa, gidrokreking va disproportsiylanish reaksiyalari vodorod ishtirokisiz maksimal qiymatga ega bo'ladi, vodorod partial bosimining oshishi bilan asta-sekin ma'lum bir chegaragacha kamayadi va keyinchalik uning ko'payishi bilan ortadi.

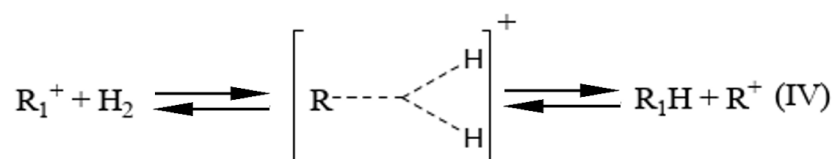
HCl-AlCl₃ va HF-BF₃ katalizatorlari ishtirokida gidrokreking va disproportsiylanish reaksiyasini vodorod bilan ingibirlash, shuningdek izomerlash reaksiyasini quyidagi reaksiya bo'yicha karbkationlar konsentratsiyasining kamayishi bilan izohlanadi:



Karbkation va parafin uglevodorod molekulasining o'zaro ta'siri bir necha usul bilan parchalanadigan oraliq pentakoordinatsiyalangan ion hosil bo'lishi orqali boradi:



Ushbu reaksiyalarning birinchisi - parafin uglevodorod izomerlanishining cheklangan bosqichi hisoblanadi; kreking va disproportsiylanish mahsulotlarining hosil bo'lishi (II) va (III) reaksiyalar borishiga asoslangan; vodorod ishtirokida karbkation yana boshqa bir reaksiyaga kirishadi:



Ushbu reaksiya (I)-(III) reaksiyalar bilan raqobatlashadi. Shunday qilib, vodorod parafin uglevodorodlarni kuchli kislotalar ishtirokida izomerlanish, gidrokreking va disproportsiyanish reaksiyalari tezligini pasaytiradi [4,5].

Vodorod katalizatorning kislota markazlarida adsorbsiyalangan ko'rinishlarning izomerlanish reaksiyalari sekin bosqichida qatnashishi taklif qilinadi.

Foydalanilgan adabiyotlar

1. Лебедев Н.Н. Химия и технология основного органического и нефтехимического синтеза: Учебник для вузов. 4-е изд., перераб. И доп. –М. Химия, 1988. – 592 с.
2. Технология переработки нефти и газа. Процессы глубокой переработки нефти и нефтяных фракций: Учеб.-метод. комплекс для студ. в 2-х ч./Сост.: С.М. Ткачев – ч.1 Курс лекций. – Новополюк: ПГУ, 2006. – 345 с.
3. Рябов В.Д. Химия нефти и газа: учебное пособие. – М.: ИД «ФОРУМ», 2009. – 336 с
4. Джураева Г.Х., Исмагов Б.А. ЗНАЧЕНИЕ ПРОЦЕССА ИЗОМЕРИЗАЦИИ ПАРАФИНОВЫХ УГЛЕВОДОРОДОВ. “NEFT VA GAZ SOHASIDA KADRLAR TAYYORLASH SIFATINI OSHIRISHDA TA'LIM VA ISHLAB CHIQRISH KLASSTERINING AHAMIYATI”. Ilmiy-amaliy konferensiya. QARSHI MUHANDISLIK-IQTISODIYOT INSTITUTI. 2023 yil.
5. Джураева Г.Х., Исмагов Б.А. ОСОБЕННОСТИ ПРОЦЕССА ИЗОМЕРИЗАЦИИ ПЕНТАН-ГЕКСАНОВОЙ .ФРАКЦИИ. Инновационные подходы к локализации: Сборник научных трудов по материалам Международной научно практической конференции г. Карши, 14 октябрь 2023 г. – 628 с.

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ADABIYOT DARSLARIDA LOYIHA ASOSIDA TA'LIM ORQALI O'QUVCHILARNING TAHLILY YOZUV KOMPETENSIYASINI RIVOJLANTIRISH

Annotatsiya. Mazkur maqolada adabiyot darslarida loyiha asosida ta'limni tashkil etish orqali o'quvchilarning tahliliy yozuv kompetensiyasini rivojlantirish masalasi yoritiladi. Tahliliy yozuv kompetensiyasi badiiy matnni mantiqiy tahlil qilish, dalil va iqtiboslar bilan asoslash, muallif uslubi hamda badiiy vositalarni izohlash, kontekstga tayangan xulosa chiqarish, fikrni akademik me'yorlarda ifodalash ko'nikmalarini bir tizimda birlashtiradi.

Kalit so'zlar: loyiha asosida ta'lim, adabiyot darsi, tahliliy yozuv, matn tahlili, argumentatsiya, dalil, rubrika, formatif baholash, teskari aloqa, refleksiya.

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DEVELOPMENT OF STUDENTS' ANALYTICAL WRITING COMPETENCE THROUGH PROJECT-BASED EDUCATION IN LITERATURE LESSONS

Abstract. This article explores how project based learning in literature classes can develop students' analytical writing competence. Analytical writing competence integrates the ability to analyze literary texts logically, support claims with evidence and quotations, interpret authorial style and literary devices, account for context, and communicate ideas using academic conventions.

Keywords: project based learning, literature education, analytical writing, textual analysis, argumentation, evidence, rubric, formative assessment, feedback, reflection.

Kirish

Texnikum va kasbiy ta'lim muhitida ona tili va adabiyot fani oldida ikki yirik vazifa turadi: o'quvchining til va nutq madaniyatini mustahkamlash hamda badiiy tafakkurni rivojlantirish. Amaliyotda esa adabiyot darsi ko'pincha syujetni qayta aytish, qahramonlarni sanab chiqish yoki muallif hayoti haqidagi tayyor ma'lumotni yod olish darajasida qolib ketadi. Bunday yondashuv o'quvchining o'qiganini tushunishiga yordam bersa ham, yozma fikrlash va tahliliy nutqni, ayniqsa dalilga

tayangan yozuvni barqaror shakllantirishda yetarli natija bermaydi. Bugungi ta'lim natijasi sifatida o'quvchi faqat bilsin emas, balki asoslasin, matndan dalil keltirsin, fikrini mantiqiy kompozitsiyada yozsin, teskari aloqa asosida matnini qayta ishlasin degan talab kuchaymoqda. Shu talablar tahliliy yozuv kompetensiyasini adabiyot darsining markaziy natijasiga aylantiradi.

Adabiyotlar sharhi

Loyiha asosida ta'lim metodikasi o'quv jarayonini mazmunli muammo savoli atrofida quradi va o'quvchini faollikka olib kiradi. Krajcik va Shin loyiha asosida o'qitishda o'quv maqsadlari bilan loyiha faoliyati uyg'un bo'lishi, o'quvchi izlanish olib borishi, hamkorlikda ishlashi, o'qituvchi esa jarayonni yo'naltiruvchi tayanch bilan ta'minlashi zarurligini ko'rsatadi [1]. Bu yondashuv adabiyot darsiga juda mos, chunki badiiy asar atrofida muammo savollari tabiiy tug'iladi: muallif qaysi g'oyani qanday badiiy vosita bilan yetkazgan, qahramon qarori qaysi ijtimoiy kontekstda shakllangan, matnda qanday qarama qarshiliklar bor, ramz va detallar qanday ishlagan. Loyiha bunday savollarni oddiy og'zaki suhbat emas, yozma mahsulot bilan yakunlanadigan izlanishga aylantiradi.

Metodikaning samaradorligi bo'yicha Chen va Yangning meta tahlili loyiha asosida o'qitish an'anaviy o'qitishga nisbatan o'quv yutuqlariga ijobiy ta'sir ko'rsatishini umumlashtiradi va ta'sirni kuchaytiruvchi omillarni tahlil qiladi [2]. Bu xulosa adabiyot darsida ham muhim: agar loyiha mazmunli savolga tayansa, vaqt to'g'ri rejalansa, o'qituvchi tayanchi mavjud bo'lsa, baholash shaffof mezonlarga asoslansa, natija faqat qiziq jarayon emas, o'lchanadigan o'sishga aylanishi mumkin.

Loyiha dizayni va sifat standartlari bo'yicha Larmer, Mergendoller va Boss loyiha ishini shunchaki taqdimot emas, qat'iy akademik natijaga xizmat qiladigan tizim sifatida ko'rsatadi. Ular loyiha sifatini belgilaydigan elementlarni, o'qituvchining boshqaruv amaliyotlarini, o'quvchini chuqur o'rganishga olib kiradigan savol va teskari aloqa mexanizmlarini muhim deb biladi [4]. Adabiyot darsida bu fikr ayniqsa dolzarb: o'quvchi ko'pincha matndan bir nechta chiroyli gap topib, taqdimot tayyorlashni loyiha deb o'ylashi mumkin, lekin tahliliy yozuv uchun dalil tanlash, dalilni sharhlash, qarama qarshi nuqtayi nazarni ko'rish, kompozitsiyani to'g'ri qurish kabi talablar doimiy boshqaruvsiz shakllanmaydi.

Tadqiqot metodologiyasi va empirik tahlil

Taklif etilayotgan metodik model uch tayanchga tayanadi: muammo savoli, dalilga tayangan yozuv, qayta ishlash sikli. Muammo savoli dars mavzusini loyiha o'qiga aylantiradi. Savol shunday bo'lishi kerakki, javob faqat syujet bilan emas, matndan dalil va tahlil bilan asoslanadi. Masalan, muallif qahramonning ichki kolliziyasini qaysi badiiy detal orqali ko'rsatgan, asardagi ramzlar qahramon taqdirini qanday yo'naltiradi, muallifning til uslubi qaysi g'oyaviy maqsadga xizmat qiladi, asar qahramoni tanlovi bugungi kasbiy odob va mas'uliyat bilan qaysi jihatdan tutashadi. Bunday savollar o'quvchini matnga qaytishga majbur qiladi, chunki dalil matnning o'zida yashaydi.

Ikkinchi tayanch dalilga tayangan yozuv bo'lib, bu yerda o'quvchi da'vo bildiradi, matndan iqtibos yoki epizod bilan dalil keltiradi, dalilni sharhlaydi va

xulosaga bog'laydi. Yozuvni shu formatga solish o'quvchiga tahlil va talqinni ajratishni o'rgatadi: matndan keltirilgan dalil bir narsa, dalilning nimani ko'rsatishi esa boshqa narsa. Yozuv topshirig'i qisqa bosqichlarga bo'linadi: avval tezis va reja, keyin dalillar ro'yxati, so'ng birinchi qoralama, undan keyin tahrir va yakuniy variant. Yozuvni bosqichlab o'rgatish va teskari aloqa bilan qayta ishlash yozuvni yaxshilashda muhim omil sifatida ko'rsatiladi [5]. Loyiha yondashuvi aynan shu bosqichlashni tabiiy qiladi, chunki loyiha mahsuloti bir martalik insho emas, tayyorlanadigan va himoya qilinadigan yakuniy tahliliy matn bo'ladi.

Uchinchi tayanch qayta ishlash siklidir. O'quvchi matnini qayta ko'rmasa, tahliliy yozuv ko'pincha fikriy sakrashlar, dalilsiz xulosa, takror va til xatolari bilan qoladi. Qayta ishlash sikli uch turdagi teskari aloqaga tayanadi: o'qituvchi teskari aloqasi, tengdosh teskari aloqasi, o'zini baholash. Bu jarayon rubrika bilan bog'lansa, teskari aloqa umumiy gaplardan chiqib, aniq mezonga aylanadi: dalil soni va sifati, dalil sharhi, kompozitsiya, til, uslub. Rubrika o'quvchini sifat mezonlari bilan oldindan tanishtiradi va yaxshilash yo'lini ko'rsatadi [6].

Natijalar

Loyiha bosqichlarini adabiyot darsiga moslab, odatda olti qadamda qurish maqsadga muvofiq. Birinchi qadam muammo savolini qo'yish va mezonlarni ochiq aytishdan boshlanadi. Bu bosqichda o'qituvchi rubrika bo'yicha kutiladigan sifatni namuna orqali ko'rsatadi: kuchli tezis qanday, dalil qanday tanlanadi, iqtibos qanday kiritiladi, dalil qanday sharhlanadi. Ikkinchi qadam matnni chuqur o'qish va dalil yig'ishdir. Bu yerda o'quvchi matndan iqtiboslarni ajratadi, badiiy vositalarni belgilaydi, qahramon nutqidan muhim joylarni topadi, muallif tasvir vositalarini yozib boradi. Uchinchi qadam reja va tezis ishlab chiqish bo'lib, o'quvchi o'z da'vosini bir gap bilan aytadi va uni uch to'rt dalil bilan ko'taradigan kompozitsiya tuzadi. To'rtinchi qadam qoralama yozish, beshinchi qadam tahrir va qayta yozish, oltinchi qadam esa yakuniy mahsulotni taqdim etish va refleksiya qilishdan iborat.

Bu jarayonda o'qituvchi tayanchi muhim. Krajcik va Shin loyiha asosida o'qitishda o'qituvchi o'quvchini mustaqillikka itaradi, lekin tashlab qo'ymaydi, ayniqsa murakkab fikrlash operatsiyalarida tayanch va yo'naltirish beradi [1]. Adabiyot darsida tayanchlar quyidagicha ko'rinishi mumkin: tezis andozasi, dalil tanlash bo'yicha savollar, iqtibos kiritish qoidalari, paragraf tuzilishi, tahrir chek ro'yxati, rubrika bo'yicha o'zini baholash savollari. Larmer va hammualliflar ham loyiha sifati o'qituvchining boshqaruv amaliyotiga bog'liqligini, sifat standartini belgilash va oraliq tekshiruvlar o'tkazish zarurligini ta'kidlaydi [4].

Baholash mezonlari: tahliliy yozuv rubrikasi uchun komponentlar Adabiyot darsidagi tahliliy yozuvni baholashda faqat imlo va punktuatsiyani ko'rish noto'g'ri natija beradi. Shuningdek faqat mazmunni baholash ham yetarli emas, chunki tahliliy yozuvning kuchi mazmun, dalil, mantiq va tilning uyg'unligida. Shuning uchun rubrika olti komponentga tayansa, baholash ham adolatli, ham o'quvchi uchun tushunarli bo'ladi.

Xulosa va munozara

Adabiyot darslarida loyiha asosida ta'limni tahliliy yozuv kompetensiyasiga yo'naltirib tashkil etish o'quvchini syujet qayta aytishdan dalilga tayangan talqin va

argumentatsiyaga olib chiqadi. Loyiha yondashuvi muammo savoli, izlanish, hamkorlik, mahsulot yaratish va o'qituvchi tayanchini bir tizimda uyg'unlashtirib, yozuvni bosqichma bosqich takomillashtirish imkonini beradi. Xalqaro meta tahlil natijalari loyiha asosida o'qitishning o'quv yutuqlariga ijobiy ta'sirini ko'rsatib, adabiyot darsida ham izlanish va mahsulotga tayangan yondashuvni metodik asoslashga xizmat qiladi. Yozuv ko'nikmasi esa o'z holicha o'smaydi, u rejalash, qoralama, teskari aloqa, tahrir va qayta yozish sikli orqali shakllanadi, bu yondashuv yozuvni kuchaytirishga doir tadqiqot xulosalari bilan uyg'un. Baholashda rubrika mezonlari o'quvchi uchun sifat yo'l xaritasini beradi, o'qituvchi uchun esa shaffof va adolatli baholashni ta'minlaydi, ayniqsa formatif baholashda rubrikaning didaktik qiymati yuqori.

ADABIYOTLAR RO'YXATI

1. Krajcik J. S., Shin N. Project-Based Learning // The Cambridge Handbook of the Learning Sciences / ed. R. K. Sawyer. Cambridge: Cambridge University Press, 2014. P. 275–297. DOI: 10.1017/CBO9781139519526.018.
2. Chen C.-H., Yang Y.-C. Revisiting the effects of project-based learning on students' academic achievement: A meta-analysis investigating moderators // Educational Research Review. 2019. Vol. 26. P. 71–81. DOI: 10.1016/j.edurev.2018.11.001.
3. Rosenblatt L. M. The Reader, the Text, the Poem: The Transactional Theory of the Literary Work. Carbondale: Southern Illinois University Press, 1994. 210 p.
4. Larmer J., Mergendoller J., Boss S. Setting the Standard for Project Based Learning: A Proven Approach to Rigorous Classroom Instruction. Alexandria, VA: ASCD, 2015. 240 p. ISBN 9781416620334.
5. Graham S., Perin D. Writing Next: Effective Strategies to Improve Writing of Adolescents in Middle and High Schools. Washington, DC: Alliance for Excellent Education, 2007.
6. Brookhart S. M. How to Create and Use Rubrics for Formative Assessment and Grading. Alexandria, VA: ASCD, 2013. 159 p. ISBN 9781416615071.

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CHIZMACHILIK FANLARINI O'QITISHDA KOMPYUTER GRAFIK TEXNOLOGIYALARIDAN FOYDALANISHNING PEDAGOGIK SAMARADORLIGI

Annotatsiya: Mazkur ilmiy maqolada chizmachilik fanlarini o'qitishda kompyuter grafik dasturlarini (AutoCAD, Compass-3D, SolidWorks, Inventor va boshqalar) joriy etishning pedagogik, didaktik va amaliy ahamiyati tahlil qilingan. Tadqiqot davomida an'anaviy chizmachilik usullari bilan kompyuter grafikasi asosidagi yondashuvlarning qiyosiy tahlili olib borildi. Natijalar shuni ko'rsatadiki, CAD tizimlari asosida tashkil etilgan ta'lim jarayoni o'quvchilarning fazoviy tafakkuri, ijodiy fikrlashi va kasbiy kompetensiyalarini samarali rivojlantiradi.

Kalit so'zlar: chizmachilik, kompyuter grafikasi, CAD tizimlari, muhandislik grafikasi, raqamli ta'lim.

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PEDAGOGICAL EFFECTIVENESS OF USING COMPUTER GRAPHICS TECHNOLOGIES IN TEACHING ENGINEERING DRAWING

Abstract: This article analyzes the importance of implementing computer graphics software in teaching engineering drawing disciplines. A comparative analysis of traditional teaching methods and CAD-based approaches is conducted. The results show that the use of computer graphics enhances spatial thinking, professional competencies, and the overall quality of engineering education.

Keywords: engineering drawing, computer graphics, CAD systems, engineering graphics, digital education.

Hozirgi globallashtirish va raqamlashtirish sharoitida muhandislik ta'limini zamonaviy texnologiyalar asosida tashkil etish dolzarb masalalardan biri hisoblanadi. Ayniqsa, chizmachilik fanlari texnik tafakkurni shakllantirishda tayanch fan sifatida muhim o'rin egallaydi. Ushbu fanlar orqali o'quvchilar buyum va konstruksiyalarning geometrik shakllarini tasvirlash, ularni tahlil qilish hamda texnik hujjatlar bilan ishlash ko'nikmalarini egallaydi.

So'nggi yillarda ishlab chiqarish va loyihalash jarayonlarida kompyuter grafik dasturlarining keng joriy etilishi ta'lim jarayonida ham mazkur dasturlardan foydalanishni taqozo etmoqda. Shu bois chizmachilik fanlarida CAD texnologiyalarini qo'llashning ilmiy-pedagogik asoslarini tadqiq etish dolzarb hisoblanadi.

Chizmachilik usullari asosiy geometrik tushunchalarni shakllantirishda juda muhim, ammo ko'p vaqt va mehnat talab etadi. Kompyuter grafikasi esa yuqori aniqlik, tezkorlik va avtomatlashtirilgan funksiyalar bilan ajralib turadi.

Kompyuter grafikasi — bu grafik obyektlarni yaratish, saqlash va qayta ishlashga yo'naltirilgan axborot texnologiyalari sohasi bo'lib, chizmachilik fanlarida asosan CAD (Computer-Aided Design) tizimlari orqali amalga oshiriladi. CAD tizimlari chizmalarni xalqaro va milliy standartlar (ISO, GOST) asosida yuqori aniqlikda bajarish imkonini beradi¹².

Tadqiqot natijalari shuni ko'rsatadiki, ushbu ikki yondashuvni uyg'unlashtirish chizmachilik fanlarini o'qitishda eng maqbul metod hisoblanadi¹³.

Chizmachilik fanini o'qitish to'g'ri tashkillashtirilgan, ammo o'qitish jarayonida zamonaviy kompyuter texnologiyalarini qo'llash borasida texnik baza yetishmasligi, pedagog kadrlar malakasi bilan bog'liq muammolar, dasturiy litsenziyalarva boshqa shu kabi obyektiv va subyektiv sabablarga ko'ra yuzaga kelayotgan muammolar¹⁴ ora-orada ko'zga tashlanib turgan bo'lsada, dars mashg'ulotlarida kompyuter grafik dasturlarini joriy etish ta'lim sifatiga ijobiy tasir qilmay qolmaydi..

“Chizmachilik” fanini o'qitishda mashg'ulotlar jarayonida kompyuter texnologiyalarini qo'llash quyidagi samarali natijalarga erishishga ko'mak beradi:

1. O'quvchilarda fanga bo'lgan munosabatni ijobiy tomonga o'zgartiradi:

Chizmachilik fanida kompyuter texnologiyalaridan foydalanish o'quvchilarning fanga bo'lgan qiziqishini oshiradi va o'quv faoliyatiga ijobiy munosabatni shakllantiradi. An'anaviy usullarda chizma chizish ko'pincha bir xil takrorlanadigan, ko'p vaqt talab etadigan jarayon sifatida qabul qilinadi. Kompyuter grafik dasturlari esa interaktiv muhit yaratib, natijani tez va aniq ko'rish imkonini beradi.

Grafik obyektlarning real va vizual ko'rinishda namoyon bo'lishi, ranglar, animatsiya va 3D modellar orqali o'qitish jarayoni o'quvchilar uchun qiziqarli

¹² SAPR / CAM nazariyasi va amaliyoti. - Makgrou, 2018. — B.97-110.

¹³ Raqamli ta'lim texnologiyalari bo'yicha ilmiy maqolalar to'plami. - Toshkent, 2022. —B.33-41.

¹⁴ Ergashev T. Chizmachilik fanini o'qitishdagi muammolar va ularni bartaraf etish. American journal of innovation in science, research and developmend. Volume:01 Issue:3|2024. -B.93-97

bo'ladi. Natijada, o'quvchi chizmachilik fanini murakkab fan emas, balki ijodiy va amaliy ahamiyatga ega fan sifatida qabul qila boshlaydi.

2. O'quvchilarning fazoviy tasavvurini shakllantirishga yordam beradi:

Fazoviy tasavvur chizmachilik fanining asosiy kompetensiyalaridan biri hisoblanadi¹⁵. Kompyuter texnologiyalari, ayniqsa uch o'lchamli (3D) modellash imkoniyatlari orqali buyumlarning fazodagi holatini chuqur anglashga xizmat qiladi¹⁶.

CAD dasturlarida obyektни aylantirish, kesimlar hosil qilish va turli proyeksiyalarda ko'rish imkoniyati mavjud bo'lib, bu o'quvchilarga tekis chizmalar orqali ifodalangan murakkab shakllarni osonroq tushunishga yordam beradi. Natijada, o'quvchilarning fazoviy tafakkuri tizimli ravishda rivojlanadi va ularning texnik tafakkuri mustahkamlanadi.

3. O'quvchilarning ijodiy va mantiqiy fikrlash qobiliyatlarini rivojlantiradi:

Kompyuter grafikasi asosida tashkil etilgan mashg'ulotlar o'quvchilarning ijodiy va mantiqiy fikrlash qobiliyatlarini rivojlantirishda muhim ahamiyat kasb etadi. Dasturiy muhitda chizma yaratish jarayonida o'quvchi har bir amalni mantiqiy ketma-ketlik asosida bajarishga majbur bo'ladi.

Bundan tashqari, parametrik modellash, o'lchamlarni o'zgartirish, alternativ yechimlarni sinab ko'rish imkoniyati o'quvchilarning ijodiy yondashuvini shakllantiradi. Bu esa ularni mustaqil qaror qabul qilishga, muammoli vaziyatlarni tahlil etishga va optimal yechim topishga o'rgatadi.

4. Uy vazifalarida grafik topshiriqlarni mustaqil va xatosiz bajarishga ko'maklashadi:

Kompyuter texnologiyalaridan foydalanish uy vazifalarini bajarishda ham samarali natijalar beradi. Grafik dasturlarda avtomatik o'lchamlash, qatlamlar bilan ishlash va xatolarni aniqlash funksiyalari mavjud bo'lib, bu o'quvchilarga chizmalarni mustaqil va aniq bajarishga yordam beradi.

Bunday imkoniyatlar o'quvchining o'z ishini tekshirishi, xatolarni tezkor tuzatishi va o'z ustida ishlash ko'nikmasini shakllantiradi. Natijada, uy vazifalarining sifati oshadi, o'quvchining o'ziga bo'lgan ishonchi kuchayadi va mustaqil ta'lim olish kompetensiyasi rivojlanadi.

Xulosa qilib aytganda, o'quvchilarning bilish faolligini rivojlantirish pedagogik jarayonning muhim omillaridan biridir¹⁷ va chizmachilik fanini o'qitishda kompyuter texnologiyalaridan foydalanishning o'quv jarayonining samaradorligini sezilarli darajada oshiradi. Ushbu texnologiyalar o'quvchilarda fanga bo'lgan qiziqishni kuchaytirib, ularning fazoviy tasavvurini shakllantirish, ijodiy va mantiqiy fikrlash qobiliyatlarini rivojlantirishga xizmat qiladi. Shuningdek, grafik dasturlar asosida tashkil etilgan mashg'ulotlar o'quvchilarning mustaqil ishlash ko'nikmalarini mustahkamlab, uy vazifalarini aniq va sifatli bajarishga imkon yaratadi. Natijada, chizmachilik fanini o'qitish jarayoni

¹⁵ Abduqodirov A.A. Muhandislik grafikasi. - Toshkent: Fan, 2019. — B.45-52.

¹⁶ Ergashev T. Jo'rayeva B. Autocad foydalanish interfeysida uch o'lchamli muhitni yaratish. Ta'lim, fan va innovatsiya. ISSN 2181-8274. 5-son, 2024-yil. B-459-466

¹⁷ Abdullayeva Sh.SH. Pedagogika. — Toshkent: Fan va texnologiyalar, 2018. — B.112–120

zamonaviy ta'lim talablari asosida takomillashib, o'quvchilarning kasbiy tayyorgarligi va raqobatbardoshligini oshirishga xizmat qiladi.

Foydalanilgan adabiyotlar:

1. SAPR / CAM nazariyasi va amaliyoti. - Makgrou, 2018. — B.97-110.
2. Raqamli ta'lim texnologiyalari bo'yicha ilmiy maqolalar to'plami. - Toshkent, 2022. —B.33-41.
3. Ergashev T. Chizmachilik fanini o'qitishdagi muammolar va ularni bartaraf etish. American journal of innovation in science, research and developmend. Volume:01 Issue:3|2024. -B.93-97
4. Abduqodirov A.A. Muhandislik grafikasi. - Toshkent: Fan, 2019. — B.45-52.
5. Ergashev T. Jo'rayeva B. Autocad foydalanish interfeysida uch o'lchamli muhitni yaratish. Ta'lim, fan va innovatsiya. ISSN 2181-8274. 5-son, 2024-yil. B-459-466
6. Abdullayeva Sh.SH. Pedagogika. — Toshkent: Fan va texnologiyalar, 2018. — B.112–120

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TEXNIKUMDA TARIX FANINI O'QITISHDA LOYIHA ASOSIDA TA'LIM METODIKASINING SAMARADORLIGI VA BAHOLASH MEZONLARI

Annotatsiya. Maqolada texnikum sharoitida tarix fanini loyiha asosida o'qitish metodikasining samaradorligini asoslash hamda baholash mezonlarini aniq va o'lchab bo'ladigan ko'rinishga keltirish masalalari yoritiladi. Loyiha asosida ta'lim o'quvchini tayyor ma'lumot iste'molchisi emas, balki tarixiy manbalar bilan ishlaydigan, dalil keltiradigan va xulosa chiqaradigan faol subyektga aylantirishi bilan ahamiyatli. Xalqaro tadqiqotlar va meta tahlillar loyiha asosida o'qitish o'quv natijalarini oshirishini, ayniqsa ijtimoiy fanlarda ta'siri sezilarliroq bo'lishini ko'rsatadi.

Kalit so'zlar: loyiha asosida ta'lim, tarix fanini o'qitish, texnikum, tarixiy tafakkur, manbalar bilan ishlash, rubrika, baholash mezonlari, kompetensiya, hamkorlikda ta'lim, refleksiya.

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EFFECTIVENESS OF PROJECT-BASED EDUCATIONAL METHODOLOGY AND ASSESSMENT CRITERIA IN TEACHING HISTORY AT A TECHNICAL SCHOOL

Abstract. This article examines the effectiveness of project based learning in teaching history in vocational college settings and proposes measurable assessment criteria. Project based learning shifts students from passive recipients of information to active investigators who work with historical sources, evidence, and argumentation. International research and meta analyses indicate that project based learning improves academic outcomes, with stronger effects often reported in social science subjects.

Keywords: project based learning, history education, vocational college, historical thinking, primary sources, rubrics, assessment criteria, competencies, teamwork, reflection.

Kirish

Texnikumda tarix fanini o'qitish ko'pincha ikki bosim orasida qoladi: bir tomonda dasturiy mavzularni o'z vaqtida o'tish talabi, ikkinchi tomonda esa o'quvchining real hayotiy ehtiyoji, kasbiy yo'nalishi va motivatsiyasi. Oddiy

ma'ruza va qayta aytib berishga tayanadigan darslar mazmunni yetkazishi mumkin, lekin tarix fani uchun eng muhim natija bo'lgan tarixiy tafakkur, dalilga tayangan xulosa, manba tanqidiyligi va tahliliy nutqni barqaror shakllantirishda ko'pincha sust ishlaydi. Shu sababli texnikum sharoitida tarix darsini faol o'qitish texnologiyalari bilan boyitish, ayniqsa loyiha asosida ta'lim metodikasini ongli tatbiq etish dolzarb masalaga aylanadi. Loyiha yondashuvi o'quvchiga tayyor bilimni berishdan ko'ra, savol qo'yish, dalil topish, manbani tekshirish, xulosa chiqarish va natijani auditoriyaga taqdim etish jarayonini boshdan kechirish imkonini yaratadi [1].

Adabiyotlar sharhi

Loyiha asosida ta'lim haqidagi adabiyotlar metodikani bir nechta tayanch belgi orqali tushuntiradi. Krajcik va Shin loyiha asosida o'qitishning markazida murakkab va mazmunli muammo savoli turishi, o'quv maqsadlari aniq belgilanishi, o'quvchi faol tadqiqot olib borishi, hamkorlikda ishlashi, oraliq ko'mak va yo'naltirish mavjud bo'lishi hamda yakunda auditoriyaga taqdim etiladigan mahsulot yaratilishini ta'kidlaydi [1]. Bu yondashuv texnikum tarix darsiga mos, chunki mavzularni hayotiy va mahalliy kontekstga ulash oson, mahsulot sifatida esa ko'rgazma, raqamli xronologiya, manbalar to'plami, intervyu arxivi, kichik muzey burchagi yoki tarixiy joylar bo'yicha yo'l xaritasi yaratilishi mumkin.

Metodikaning samaradorligi masalasida Chen va Yangning meta tahlili muhim dalil beradi: u 1998 yildan 2017 yilgacha chop etilgan ishlardan olingan taqqoslashlarni umumlashtirib, loyiha asosida o'qitish an'anaviy o'qitishga nisbatan o'quv natijalarini yaxshilashini ko'rsatadi, shuningdek ijtimoiy fanlarda ta'sir kuchliroq bo'lishi mumkinligi ham qayd etiladi [2]. Bu fakt tarix fani uchun ayniqsa qiziq, chunki tarixdagi muvaffaqiyat ko'pincha tushunish, talqin, dalillash va tanqidiy fikrlashga bog'liq, loyiha metodikasi esa aynan shu jarayonlarni darsning markaziga olib chiqadi.

Tarix ta'limining mazmuniy tomoni Wineburg ishlarida chuqur asoslanadi. U tarixiy fikrlash oddiy kundalik fikrlashdan farq qilishini, o'quvchi matnni haqiqat sifatida qabul qilishdan oldin uning manbasi va maqsadini ko'rishi, davr sharoitini hisobga olishi, turli dalillarni solishtirish orqali ishonchlilikni tekshirishi kerakligini ko'rsatadi [3]. Texnikum o'quvchilari uchun loyiha metodikasi aynan shu ko'nikmalarni mashq qilishga qulay, chunki loyiha jarayonida manba tanlash, uni tahlil qilish, ishonchli va shubhali dalillarni ajratish, xulosa chiqarish majburiy bosqichlarga aylanadi.

Tadqiqot metodologiyasi va empirik tahlil

Texnikumdagi tarix loyihasi mavzu tanlashdan boshlanadi, lekin mavzuning o'zi yetarli emas, uni harakatga keltiradigan asosiy narsa muammo savolidir. Muammo savoli shunday tuzilishi kerakki, o'quvchi uni internetdan bir sahifada ko'chirib qo'ya olmasin, javob izlash uchun manbaga murojaat qilsin, turli nuqtayi nazarlarni solishtirsin va yakuniy xulosani dalil bilan himoya qilsin. Masalan, mahalliy tarix bilan bog'liq savollar texnikum o'quvchisiga yaqin: hududdagi sanoat korxonasi tarixining mehnat migratsiyasiga ta'siri, shaharsozlikdagi o'zgarishlar va ularning ijtimoiy hayotga ta'siri, urush yillari front orti mehnati,

tarixiy obidalar saqlanishidagi muammolar. Bunday savollar nafaqat tarixiy fakti, balki sabab va oqibatni, manba ishonchliligini va kontekstni tahlil qilishni talab qiladi, bu esa tarixiy tafakkurni o‘stiradi [3].

Ikkinchi tamoyil o‘quv maqsadlarini ikki qatlamda belgilashdir. Birinchi qatlam fan mazmuni: davr, voqea, shaxslar, tushunchalar, tarixiy jarayonlar. Ikkinchi qatlam esa ko‘nikma va kompetensiya: manbani tahlil qilish, dalillash, yozma va og‘zaki nutq, jamoada ishlash, vaqtni boshqarish, axborot madaniyati. Krajcik va Shin loyiha asosida ta’limda o‘qituvchi aynan shu maqsadlar uyg‘unligini saqlashi zarurligini, aks holda loyiha faqat faoliyatga aylanib, o‘qitish natijasi so‘nib qolishini ta’kidlaydi [1]. Texnikum sharoitida bu ayniqsa dolzarb, chunki o‘quvchi kasbiy fanlar bilan band, tarixga ajratilgan vaqt cheklangan bo‘lishi mumkin, demak loyiha ortiqcha cho‘zilmasligi, lekin maqsadli bo‘lishi kerak.

Uchinchi tamoyil o‘qituvchining rolini to‘g‘ri tushunishdir. Loyiha yondashuvida o‘qituvchi nazoratchi emas, yo‘l ko‘rsatuvchi va sifat kafolati beruvchi boshqaruvchi bo‘lib qoladi. Larmer va hamkorlar loyiha sifatini ta’minlash uchun o‘qituvchi dars madaniyatini qurishi, loyiha rejasini aniq qilishi, standart va natijaga moslashtirishi, faoliyatni boshqarishi, baholashni muntazam olib borishi, o‘quvchini kerakli joyda tayanch bilan ta’minlashi va murabbiy sifatida kuzatib borishini ko‘rsatadi [4]. Texnikumda bu rol ayniqsa muhim, chunki guruhli ishda mas’uliyat bo‘linib ketishi, kuchli o‘quvchi hammasini qilib qo‘yishi, boshqalar chetda qolib ketishi xavfi bor. Demak, jarayonni ko‘rinadigan qilish, har bir o‘quvchi hissasini qayd etish va baholash modeli bilan boshqarish shart.

Natijalar

Loyiha metodikasida baholashning eng katta xatosi shunday: faqat yakuniy taqdimotga ball qo‘yish. Bu yondashuvda jarayon yo‘qoladi, adolat buziladi va o‘quvchi nimani yaxshilash kerakligini anglamaydi. Brookhart rubrika mezonlari o‘quvchi uchun yo‘l xaritasi vazifasini o‘tashi, u orqali o‘quvchi sifatni ko‘rishi, o‘zini baholashi va takomillashtirishga intilishi mumkinligini ko‘rsatadi [6]. Shuning uchun texnikum tarix loyihasida baholash modelini ikki qatlamli qilish maqsadga muvofiq: jarayon bahosi va mahsulot bahosi. Jarayon bahosi loyiha kundaligi, oraliq hisobot, manbalar ro‘yxati, guruh ichidagi rol va vazifa bajarilishi, oraliq taqdimotdagi fikr almashish kabi indikatorlar orqali yig‘iladi. Mahsulot bahosi esa yakuniy ishning mazmuni, dalillash darajasi, manbaga tayanish sifati, xulosa asoslanganligi, vizual va nutqiy taqdim etish, auditoriya savollariga javob bera olish kabi indikatorlar orqali beriladi [1], [4].

Tarix fani uchun mezonlarni umumiy va fan xususiy komponentlarga ajratish juda qulay. Fan xususiy komponentlar ichida tarixiy mazmunning to‘g‘riligi va aniqligi, vaqt va makon kontekstini to‘g‘ri tushuntirish, tushunchalar bilan ishlash, sabab va oqibatni ajratish, turli nuqtayi nazarni ko‘rsatish, dalil va talqin chegarasini ajratish kabi mezonlar bo‘ladi. Wineburg yondashuvi bo‘yicha manba bilan ishlash mezonlari alohida ko‘rinadi: manbaning kelib chiqishini ko‘rsatish, muallif va maqsadni tushunish, manbaning cheklovlarini aytish, boshqa manbalar bilan solishtirib tekshirish va shundan keyin xulosa berish [3]. Umumiy komponentlar esa kompetensiyaga tegishli: hamkorlik, reja va vaqtni boshqarish, axborot madaniyati,

taqdimot ko'nikmasi, refleksiya. Krajcik va Shin loyihada hamkorlik va mahsulot yaratish bilan birga, o'qituvchining tayanch va yo'naltirishi bo'lishi kerakligini ta'kidlaydi, shuning uchun rubrikada o'qituvchi bergan talab va mezonlarga mos ishlash ham aks etishi lozim [1].

Xulosa va munozara

Texnikumda tarix fanini loyiha asosida o'qitish metodikasi o'quvchini faol o'rganuvchiga aylantirishi, tarixiy tafakkurni rivojlantirishi va dars mazmunini hayotiy kontekstga bog'lashi bilan samarali yondashuv hisoblanadi. Xalqaro meta tahlil natijalari loyiha asosida ta'lim o'quv yutuqlarini oshirishini va ijtimoiy fanlarda ta'siri sezilarli bo'lishi mumkinligini ko'rsatadi, bu tarix darsi uchun metodik asos bo'la oladi [2]. Biroq samaradorlik o'z o'zidan kelmaydi, u loyiha dizayni va baholash tizimining aniqligiga bog'liq. Loyiha sifatining tayanchi muammo savoli, maqsadlarning aniqligi, manbaga tayangan tadqiqot, hamkorlik va mahsulot yaratish kabi elementlar bo'lib, ular didaktik jihatdan asoslangan holda boshqarilganda natija beradi [1], [4], [5]. Tarix fanida esa baholash mezonlari tarixiy fikrlash talablariga mos bo'lishi, manba tanqidiyligi, kontekst, solishtirish va dalillash kabi indikatorlarni o'lchashi zarur [3]. Rubrika asosida baholash esa o'quvchiga sifat mezonlarini ko'rsatib, o'zini baholash va takomillashtirishni kuchaytiradi, shu bilan baholashni adolatli va shaffof qiladi [6].

ADABIYOTLAR RO'YXATI

1. Krajcik J. S., Shin N. Project Based Learning // The Cambridge Handbook of the Learning Sciences / ed. R. K. Sawyer. 2nd ed. Cambridge: Cambridge University Press, 2014. P. 275–297. DOI: 10.1017/CBO9781139519526.018.
2. Chen C.-H., Yang Y.-C. Revisiting the effects of project-based learning on students' academic achievement: A meta-analysis investigating moderators // Educational Research Review. 2019. Vol. 26. P. 71–81. DOI: 10.1016/j.edurev.2018.11.001.
3. Wineburg S. S. Historical Thinking and Other Unnatural Acts: Charting the Future of Teaching the Past. Philadelphia: Temple University Press, 2001. 272 p.
4. Larmer J., Mergendoller J., Boss S. Setting the Standard for Project Based Learning: A Proven Approach to Rigorous Classroom Instruction. Alexandria, VA: ASCD, 2015. 240 p. ISBN 9781416620334.
5. Polat E. S., Bukharkina M. Yu., Moiseeva M. V., Petrov A. E. Novye pedagogicheskie i informatsionnye tekhnologii v sisteme obrazovaniya / ed. E. S. Polat. Moscow: Izdatelskiy tsentr Akademiya, 2002. 272 p. ISBN 5-7695-0811-6.
6. Brookhart S. M. How to Create and Use Rubrics for Formative Assessment and Grading. Alexandria, VA: ASCD, 2013.

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HYPERTENSION AND PREECLAMPSIA: CLINICAL AND PATHOGENETIC RELATIONSHIPS

Abstract: Hypertension (HT) and preeclampsia (PE) are common pathological conditions characterized by elevated blood pressure and target organ damage. The aim of this study was to examine the relationship between chronic hypertension and the development of preeclampsia in pregnant women.

An analysis of literature data and clinical observations of 120 pregnant women with various forms of hypertension was conducted. It was found that hypertension increases the risk of developing preeclampsia by 3-4 times.

The main pathogenetic mechanisms are endothelial dysfunction, impaired placental perfusion and systemic inflammatory response.

Key words: hypertension, arterial hypertension, pregnancy, preeclampsia, endothelial dysfunction, placental insufficiency.

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GIPERTENZIYA VA PREEKLAMPSIYA: KLINIK VA PATOGENETIK ALOQALAR

Annatatsiya: Gipertenziya (HT) va preeklampsi (PE) qon bosimi ortishi va maqsadli organlarning shikastlanishi bilan birga keladigan keng tarqalgan patologik holatlardir. Ishning maqsadi surunkali arterial gipertenziya va homilador ayollarda preeklampsi rivojlanishi o'rtasidagi bog'liqlikni o'rganish edi. Gipertenziyaning turli shakllari bilan og'rigan 120 homilador ayolning adabiyot ma'lumotlari va klinik kuzatuvlari tahlili o'tkazildi. Gipertenziya preeklampsi rivojlanish xavfini 3-4 barobar oshirishi aniqlandi. Asosiy patogenetik mexanizmlar - endotelial disfunktsiya, platsenta perfuziyasining buzilishi va tizimli yallig'lanish reaksiyasi.

Kalit so'zlar: gipertoniya, arterial gipertenziya, homiladorlik, preeklampsi, endotelial disfunktsiya, platsenta etishmovchiligi.

Introduction

Hypertension (essential hypertension) is a chronic disease characterized by persistently elevated blood pressure and target organ damage. According to the

World Health Organization (WHO), hypertension occurs in 20–30% of the adult population and 5–10% of pregnant women.

Preeclampsia is a specific complication of pregnancy that occurs after the 20th week of gestation and is characterized by arterial hypertension, proteinuria and multiple organ dysfunction.

Although the pathogenesis of preeclampsia differs from that of classical hypertension, both conditions have similar components: endothelial dysfunction, vasospasm, and microcirculation disorders.

The aim of this study was to determine the clinical and pathogenetic relationships between hypertension and preeclampsia, and to assess the impact of baseline hypertension on pregnancy and perinatal outcomes.

Research Materials and Methods

The study was conducted at a provisional obstetrics department. The study included 120 pregnant women, followed from 12 to 40 weeks of gestation.

Observation groups:

- Group I (main) — 60 women with hypertension stages I–II;
- Group II (control) — 60 apparently healthy pregnant women without hypertension.

Exclusion criteria were: chronic kidney disease, diabetes mellitus, systemic connective tissue diseases, multiple pregnancy.

Methods:

1. Clinical examination: blood pressure measurement, weight monitoring, edema assessment.
2. Laboratory tests: determination of proteinuria, creatinine, uric acid levels, and liver enzyme activity.
3. Instrumental methods: ultrasound examination, Doppler ultrasound of uteroplacental blood flow.
4. Statistical analysis: data were analyzed using SPSS 26.0. Results are presented as mean $\pm$ standard deviation, significance level $p < 0.05$.

Study Results

Of the 60 women with hypertension, preeclampsia developed in 24 (40%), compared to only 6 (10%) in the control group ($p < 0.01$). The average blood pressure in patients with preeclampsia was 155/100 mmHg, significantly higher than in pregnant women with isolated hypertension without complications (138/88 mmHg).

When analyzing biochemical parameters, an increase in the level of uric acid (on average 480 ± 60 $\mu\text{mol/l}$ versus 310 ± 45 $\mu\text{mol/l}$, $p < 0.05$) and AST/ALT activity was revealed, which indicates the involvement of the liver in the pathological process.

According to Doppler data, an increase in the resistance index in the uterine arteries was noted (0.76 ± 0.05 versus 0.64 ± 0.03 , $p < 0.05$), which indicates a violation of placental blood flow.

In newborns born to mothers with a combination of hypertension and PE, signs of intrauterine growth retardation (in 28% of cases) and low birth weight (< 2500 g - in 22% of children) were noted.

Discussion

These findings confirm that hypertension is a significant risk factor for the development of preeclampsia. Chronic hypertension creates the preconditions for a decrease in the adaptive capacity of a pregnant woman's vascular system.

Pathogenetically, both conditions are united by endothelial dysfunction, accompanied by a disruption in the production of vasoactive substances (NO, endothelin, prostacyclin), platelet activation and increased vascular permeability.

Impaired trophoblast invasion during placenta formation leads to hypoperfusion and ischemia, in response to which antiangiogenic factors (sFlt-1, endogelin-1) are released, aggravating systemic vasospasm.

Thus, preeclampsia in patients with hypertension is more severe, accompanied by severe proteinuria, nephropathy and deterioration of fetoplacental blood flow.

Conclusions

1. Hypertension increases the risk of developing preeclampsia by 3-4 times compared to healthy pregnant women.

2. Common pathogenic mechanisms of the two conditions include endothelial dysfunction, systemic vasospasm, and impaired placental perfusion.

3. Patients with a combination of hypertension and PE are more likely to experience adverse perinatal outcomes, including fetal growth restriction and neonatal malnutrition.

4. To reduce the risk of complications, it is necessary to detect hypertension early, be monitored by a cardiologist, and prescribe preventive measures (low doses of aspirin, weight control, and normalizing lifestyle).

Literature.

1. Эргашева, М. Т., et al. "ЭФФЕКТИВНОСТЬ ЛЕЧЕНИЯ ХРОНИЧЕСКИХ ЗАБОЛЕВАНИЙ СЕРДЦА НЕДОСТАТОЧНОСТЬ В ЗАВИСИМОСТИ ОТ ФУНКЦИОНАЛЬНОГО СОСТОЯНИЯ ПОЧЕК." *Journal of new century innovations* 26.1 (2023): 115-123.
2. Khusainova, Munira Alisherovna, et al. "Quality Of Life In Women During The Menopausal Transition." *International Conference on Global Trends and Innovations in Multidisciplinary Research*. Vol. 1. No. 6. 2025.
3. Normatov, Murod Buribayevich, et al. "Impact Of Obesity And Metabolic Comorbidities On Functional Capacity And Quality Of Life In Heart Failure With Preserved Ejection Fraction." *International Conference on Global Trends and Innovations in Multidisciplinary Research*. Vol. 1. No. 6. 2025.
4. Камолова, Д. Ж. "АРТЕРИАЛЬНАЯ ГИПЕРТЕНЗИЯ ПРИ БЕРЕМЕННОСТИ: КЛИНИЧЕСКИЕ АСПЕКТЫ И ИСХОДЫ." *Экономика и социум* 11-1 (138) (2025): 918-921.
5. Alisherovna, Khusainova Munira, et al. "Assessment of renal dysfunction in patients with chronic heart failure." (2022).
6. Alisherovna, K. M., et al. "EFFECTIVENESS OF STATINS IN THE PREVENTION OF ISCHEMIC HEART DISEASE." *Web of Scientist: International Scientific Research Journal* 3.10 (2022): 406-413.

7. Yarmatov, Suvon Tatlibayevich, et al. "Rheumatoid Arthritis Activity During Pregnancy And Postpartum: Clinical Observations." *International Conference on Global Trends and Innovations in Multidisciplinary Research*. Vol. 1. No. 6. 2025.
8. Khusainova, Munira Alisherovna. "Therapy Of Rheumatoid Arthritis During Pregnancy." *International Conference on Global Trends and Innovations in Multidisciplinary Research*. Vol. 1. No. 5. 2025.
9. Alisherovna K. M. et al. Endothelial Dysfunction in Patients with Chronic Heart Failure //Miasto Przyszłości. – 2022. – T. 30. – C. 218-220.
10. Khabibovna, Y. S., et al. "THE EFFECTIVENESS OF THYROSTATICS IN THE TREATMENT OF." *Journal of new century innovations* 29.1 (2023): 79-88.

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YOSHLARDA MA’NAVIY-AXLOQIY TARBIYA MAZMUNI

Annotatsiya: *Ushbu maqolada ma’naviy-axloqiy tarbiya haqida umumiy tushunchalar, ma’naviyaxloqiy xulq-atvor, ma’naviy-axloqiy tarbiya metodlari haqida ma’lumotlar berilgan. Axloq va axloqiy ong tushunchalari ma’nosi ochib berilgan.*

Tayanch tushunchalar: *axloq, ma’naviyat, tarbiya, ma’naviy axloqiy tarbiya, ma’naviy-axloqiy tushunchalar, ma’naviy-axloqiy xulq-atvor, ma’naviy-axloqiy tarbiya metodlari.*

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CONTENT OF SPIRITUAL AND MORAL EDUCATION IN YOUTH

Abstract *This article provides general concepts about spiritual and moral education, about spiritual and moral behavior, about methods of spiritual and moral education. The meaning of the concepts of morality and moral consciousness is revealed.*

Keywords: *morality, spirituality, upbringing, spiritual and moral education, spiritual and moral concepts, spiritual and moral behavior, methods of spiritual and moral education.*

Yoshlar ma’naviy-axloqiy tarbiyasi — bu shaxsning ruhiy dunyosini boyitish, unda axloqiy fazilatlarni shakllantirish va hayotiy qadriyatlar tizimini mustahkamlashg qaratilgan uzluksiz jarayondir. Uning mazmuni yosh avlodni har tomonlama barkamol, jamiyat oldida mas’uliyatli va vatanparvar inson sifatida voyaga yetkazishga xizmat qiladi. Milliy qadriyatlar: o‘z milliy madaniyati, urf-odatlar, tarixi va adabiyotini chuqur anglashiga ko‘maklashadi. Bu orqali ularda milliy g‘urur, o‘zligiga hurmat hissi shakllanadi. Umuminsoniy qadriyatlar: Insonparvarlik, tinchliksevarlik, adolat, mehr-oqibat kabi umuminsoniy fazilatlarning axamiyati tushuntiriladi. Dunyoqarashni kengaytirish: Yoshlarning fikrlash doirasi, o‘zini anglash, hayotga ijobiy munosabat, maqsad sari intilish kabi sifatleri mustahkamlanadi. Axloqiy mazmuni: Har qanday vaziyatda halol bo‘lish, adolatli qaror qabul qilish, burch va mas’uliyatni his etish tarzida tarbiyalanadi.

Tarbiyaning asosiy vazifalari

- Yoshlarning mustaqil fikrlash qobiliyatini rivojlantirish.

- Yot va zararli g'oyalarga qarshi ma'naviy immunitetni mustahkamlash.
- Ijtimoiy faollikni oshirish va jamiyat taraqqiyotiga hissa qo'shish ruhini shakllantirish.
- Barkamol, ma'rifatli, o'z so'ziga va amaliga mas'ul bo'lgan avlodni voyaga yetkazish.

Mamlakatimizda ma'naviy va jismoniy barkamol yosh avlodni tarbiyalash masalasi har doim davlat siyosatining muhim bir bo'g'ini bo'lib kelgan. Shu paytgacha bu borada ulkan ishlar amalga oshirilayotgan bo'lsa-da, bu islohotlar bugungi davr talablari darajasida keng qamrovli emasligi hamda ba'zi sohalarda kamchiligi ko'rinib qolayotganligi hech kimga sir emas. O'zbekiston Respublikasi Prezidenti Shavkat Miromonovich Mirziyoevning Oliy Majlisga va O'zbekiston xalqiga murojaatnomasida shunday deb ta'kidlagan edi: "...yoshlarni zamonaviy bilim va tajribalar, milliy va umumbashariy qadriyatlar asosida mustaqil va mantiqiy fikrlaydigan, ezgu fazilatlar egasi bo'lgan insonlar etib voyaga yetkazamiz"[1].¹⁸

"Milliy tarbiya" tushunchasi ko'p qirrali bo'lib, uning milliy qadriyatlar asosida olib boriluvchi maqsadga yo'naltirilgan tarbiyaviy faoliyati, umuminsoniy tarbiyaning har bir xalqqa xos va mos betakror shakli, xalq va uning madaniyatini saqlab qolish, tiklash va rivojlantirishdan iborat.

Ma'naviy qadriyatlar va milliy o'zlikni anglashning tiklanishi, biror-bir jamiyat imkoniyatlarini, odamlar ongida ma'naviy va axloqiy qadriyatlarni rivojlantirmay hamda mustahkamlamay turib, o'z istiqbolini tasavvur eta olmaydi. Mustaqilligimizning dastlabki kunlaridanoq ajdodlarimiz tomonidan ko'p asrlar mobaynida yaratilib kelingan g'oyat ulkan, bebaho ma'naviy va madaniy merosni tiklash davlat siyosati darajasiga ko'tarilgan nihoyatda muhim vazifa bo'lib qoldi. Biz ma'naviy qadriyatlarning tiklanishini, milliy o'zlikni anglashni xalqning ma'naviy sarchashmalariga, uning ildizlari bilan uzviy bog'liq, tabiiy jarayon deb hisoblaymiz. Jamiyatimizning, xalqimizning ming yillik ma'naviy-axloqiy yuksalish tajribasini o'zida jamlagan Islom madaniyatini tiklash o'z taqdirini o'zi belgilash, tarixiy xotiraga, madaniy-tarixiy birlikka yega bo'lish yo'lidagi g'oyat muhim qadam bo'ldi. Ma'naviy qadriyatlarning yana bir qudratli manbayi an'anaviy oila va qarindoshlik munosabatlari odobidan iboratdir. Kattalarni hurmat qilish, o'zaro yordamlashish, kelajak avlod haqida g'amxo'rlik qilish hamisha uning asosiy qoidalari bo'lib kelgan.

Axloqiy tarbiya — shaxs dunyoqarashini shakllantirishning muhim omili. Shaxs dunyoqarashining shakllanishida ma'naviyaxloqiy tarbiya muhim o'ringa ega bo'lib, uni samarali tashkil etish o'quvchida ma'naviy-axloqiy ongini shakllantirishga yordam beradi. Axloq (lotincha „moralis“ — xulq-atvor ma'nosini bildiradi) ijtimoiy munosabatlar hamda shaxs xatti-harakatini tartibga soluvchi, muayyan jamiyat tomonidan tan olingan va rioya qilinishi zarur bo'lgan xulq-atvor qoidalari, mezonlari yig'indisi. Axloqiy me'yorlar to'g'risidagi bilimlar o'quvchilar ongiga ta'lim va tarbiya jarayonida singdirilib boriladi. Axloqiy tarbiyaning natijasi

¹⁸ Shavkat Mirziyoyevning 2020-yil 24-yanvardagi Oliy Majlisga Murojaatnomasi

o'quvchilarda axloqiy ong, axloqiy faoliyat ko'nikmalari va axloqiy madaniyatning shakllanishida ko'rinadi. „Axloq“, „xulq“ va „atvor“ so'zlari arabcha so'z bo'lib, ular o'zbek tilida ham o'z ma'nosida qo'llaniladi. Ayrim odamlar „Axloq — kishilarning har bir jamiyatga xos xulq me'yorlari majmuyi“ deyishsa, boshqalar yesa „Axloq — ijtimoiy ong shakllaridan biri bo'lib, hamma sohalarda kishilarning xatti-harakatlarini tartibga solish funksiyasini bajaradi“, deyishadi. Axloq me'yorlari xulq-atvorning regulyatori sifatida odat me'yorlariga zid xatti-harakat axloqsizlik harakati deb qaraladi. Shunisi ham borki, huquq majburiy bo'lsa, axloq ixtiyoriydir. Axloqiy tarbiya odamlarni nomusli vijdonli, adolatli, vatanparvar, mehnatsevar bo'lishga o'rgatadi. Axloqiy tarbiyada yaxshi xulqni takomillashtirish uchun kurashiladi. Xalq ta'limi tizimida o'qitish tarbiyalanuvchilarning axloqiy mukammallashishi bilan bog'liq bo'ladi.

Ularda ong bilan xulq birligi tarbiyalanadi. Shaxsning jamoat va vatanga, mehnatga, kishilarga, o'z xulqiga munosabatlari quyidagilarda o'z aksini topgan:

- a) jamiyatga, vatanga muhabbat va sadoqatni tarbiyalash;
- b) mehnatga axloqiy munosabatni tarbiyalash;
- d) atrofdagi kishilarga axloqiy munosabat, yuqori muomala madaniyatiga ega bo'lgan shaxsni shakllantirish;
- e) shaxsning o'ziga, o'z xulqiga axloqiy munosabatni tarbiyalash.

Qadriyatlar o'zining mazmun-mohiyatiga ko'ra bir necha turlarga bo'linadi, ya'ni:

- tabiiy qadriyatlar (yashash uchun zarur bulgan tabiiy shart-sharoitlar);
- iqtisodiy qadriyatlar (ishlab chiqarish kuchlari va vositalari);
- ijtimoiy-siyosiy qadriyatlar (yerkinlik, tenglik, adolat, tinchlik, hamkorlik);
- ilmiy qadriyatlar (bilimlar, tajribalar, yutuqlar);
- falsafiy qadriyatlar (g'oyalar, mafkuralar, konsepsiyalar);
- badiiy qadriyatlar (san'at, adabiyot, madaniyat);
- diniy (iymon, ye'tiqod, vijdon, savob).

Xulosa. Xulosa qilib aytadigan bo'lsak, Milliy qadriyatlar ma'lum bir millat, xalq va elatlarning o'z tarixiy taraqqiyotida yaratadigan barcha moddiy va madaniy (ma'naviy) boyliklari yig'indisidan iboratdir. Qadriyatlar turli-tuman bo'lib, bular ichida „eng oliy qadriyat — inson“ hisoblanib, qolgan barcha qadriyatlar unga xizmat qiladi. Inson qadriyatining ma'naviy, tarixiy hamda ta'limiy jihatlarini o'ziga xos yangicha fikrlash va yondoshishlarga asoslanadi. Jamiyatda milliy qadriyatlarni o'z qalbida mustahkam saqlash, atrof-muhit, tabiat va hayotni go'zal, farovon qilish, demokratiya asoslari hamda jamiyatda amal qilayotgan progressiv g'oyalar buyuk qadriyat hisoblanadi. Shu ma'noda o'sib kelayotgan yosh avlodda yuksak ma'naviy-axloqiy sifatlarni tarkib toptirish zaruriyati yuzaga keldi. Axloq kishilik jamiyati tarixiy taraqqiyoti davomida vujudga kelib, tarkib topgan, takomillashib kelgan me'yor va qoidalardan iborat bo'lib, ular kishilarning jamiyatga bo'lgan munosabatlarini tartibga soladi. Bu me'yor va tartibqoidalar kishilardan jamiyat uchun zarur bo'lgan axloqqa ega bo'lishlikni talab qiladi. Axloq insonning

dunyoqarashi, xulqini belgilovchi insoniy fazilatdir. Shu bois dunyoqarash o'zgarmaguncha inson ham o'zgarmaydi.

FOYDALANILGAN ADABIYOTLAR RO'YXATI

1. O'zbekiston Respublikasi Prezidenti Shavkat Miromonovich Mirziyoevning Oliy Majlisga va O'zbekiston xalqiga murojaatnomasi. Toshkent. 2020 yil 29 yanvar.
2. O'zbekiston Respublikasi Prezidentining 2017 yil 5 iyuldagi PF-5106 – son farmoni “Yoshlarga oid davlat siyosati samaradorligini oshirish va O'zbekiston yoshlari ittifoqi faoliyatini qo'llab-quvvatlash to'g'risida” Toshkent shahri, 2017 yil 5 iyul.
3. “O'zbekiston Respublikasida yoshlarga oid davlat siyosati asoslari” to'g'risidagi qonun. 1991 yil.
4. Karimov. I.A. Jamiyatimiz mafkurasi xalqni – xalq, millatni – millat qilishga xizmat etsin. T.: “O'zbekiston”, 1998, 17 – bet.

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DESCRIPTION OF ORE AND NON-ORE MINERALS OF THE SOUTHWESTERN HISSAR REGION

Abstract: *This article provides a general description of underground mineral resources, ore and non-ore deposits in the southwestern Hissar region, and their economic significance.*

Key words: *minerals, mineral resources, non-ferrous metals.*

Introduction. One of the important tasks is to study the importance of mineral resources in finding natural resources necessary for production, determining their economic evaluation and effective use, transforming nature in a way that is suitable for the purpose and harmless to nature itself and society, comprehensively studying the impact of human economic activity on nature, the main forms, directions and intensity of landscape changes due to this impact, and developing scientific forecasts of the possible consequences of such changes.

The main part. There are no coal deposits of industrial importance in the Kashkadarya region. The region's coal needs can be partially met by the Yakkabog coal mine between the villages of Vori and Zarmas in the Chakmonkuydi Mountains.

In the southeast of Dehqanabad district, deposits of oil shale have been identified in Dehqanabad, Khojarna, Kyzylcha, Dardara, Kann and other deposits. However, their industrial significance is not yet clear. However, it is important to continue research to identify deposits of oil shale raw materials and their reserves, given that neroline, a cotton growth stimulant, can be obtained from the shales.

In the Kashkadarya region, manganese reserves belonging to the category of non-ferrous metal ores were discovered in the Davtash and Kyzylbayrak deposits on the southwestern slopes of the Koratepa Mountains (Chirokchi district). After exploration work was carried out and the metal reserves were identified, technological testing of the ore was carried out, and it was determined that manganese is deposited in psilomellans and pyrolusites, as well as in limestones and sandstones. However, these small deposits of manganese ores are not of industrial importance. The reserves of the Davtash deposit are 0.8 million tons, the content of manganese in the ore is 16.8%. The deposit can be mined in an open-pit manner. The ores of the Kyzylkon deposit can be used as microfertilizers in the metallurgical industry and in agriculture. Because manganese ore contains cobalt, molybdenum,

copper, zinc and other chemical elements. The use of manganese ores in these deposits in ferrous metallurgy under current conditions is not economically feasible, but may be of great importance for geological exploration. It is noteworthy that traces of black ore were found in a bismuth ore deposit, which is rare in nature, on the southern slopes of the Koratepa Mountains.

Several deposits with signs of iron ore (Tutak Ota, etc.) have been discovered in the Hissar mountain ranges. The ore reserves discovered in them are not very large, so they are temporarily closed.

It is known that Uzbekistan has very large deposits of potassium and Osh salt. According to estimates, potassium salts will last for more than 100 years, and the reserves of Osh (rock) salt in the deposits of our country amount to 90 billion tons. In the mountainous part of the Kashkadarya region - in the Dehqanabad, Kamashi and Guzar districts - large reserves of table salt and potassium salt have been discovered.

Salt and potassium. Hissar province includes the Dehqanabad salt basin (southwestern branches of the Hissar ridge). The Dehqanabad salt basin includes the Boybachchakon, Hamkon and other salt structures. Very large deposits of Boybichchakon and Tapaquton table salt have been identified here. The thickness of the salt layers within the entire basin is 200 - 600 m.

The Boybachchakon table salt deposit is located in the Kamashi district, 12 km southeast of the village of Langar and 52 km southeast of the city of Kamashi. The salt layers are located at depths of 600 - 1000 m below the surface. The thickness of the productive layer is 240 m, the content of NaCl is 94.56%. The balance reserves of category S1 salts are 234.6 million tons, and category S2 - 485.1 million tons. The prospective reserves of table salt are very large.

Salt has also been identified in the Tapaqutan potash salt deposit. The reserves of table salt here amount to 6.1 million tons.

The share of the Kashkadarya region is about 70% of the estimated reserves of potash salts in Uzbekistan and almost 100% of the reserves on the balance sheet. ("Экономический потенциалный гор и предгорий ...", 1982").

The Akbash Tapaquton, Kaypantov and Pachkamar salt fields have been identified in the southwestern branches of the Hissar Range. The largest of them is the Tapaquton deposit, located 30 km northeast of the town of Dehqanabad. The estimated reserves of potassium salts in this deposit are 500 million tons, including 400 million tons of A+B+C categories. The depth of the layers ranges from 117 m to 936 m, the average thickness of the layer is 5.1 m, and it is observed on an area of 81 km².

It was planned to organize the production of potash fertilizers with the participation of foreign investors on the basis of the Tapaquton potash salt deposit.

By the Resolution of the President of the Republic of Uzbekistan No. PP-632 dated May 1, 2007, it was determined that the construction of the Dehqanabad Potash Fertilizer Plant would be carried out on the basis of an investment project.

The Cabinet of Ministers, having adopted Resolution No. 150 on July 24, 2007, appointed the customer, designer and general contractor organizations for financing, designing and constructing external infrastructure facilities of the plant.

The main components of the plant are the processing complex and the mining complex, based on the decision of the government tender commission, it was decided to conclude a contract for the processing complex with the company "SITIK" (China), and for the mining complex with the company "ZUMK Engineering" (Russia). Potash raw materials are mined in a closed way from the Tapaquton deposit in Dehqanabad district. The proven reserves of the deposit are 215.3 million tons, and the first section to be commissioned has reserves of 44.547 million tons of potash raw materials (KCl). The designed capacity is designed to extract 700 thousand tons of raw materials per year. The processing complex will produce 200 thousand tons of potash fertilizer per year from this amount of raw materials. 110 thousand tons of the product will be used for the country's needs, and 90 thousand tons will be exported.

Complex processing of salts allows to obtain brominated iron, magnesite, gypsum and other materials on the go.

Osh salt is also found in the Tapaqutan potash salt deposit. The reserves of osh salt here are 6.1 million tons.

Kashkadarya region accounts for about 70% of the estimated reserves of potash salts in Uzbekistan and almost 100% of the reserves on the balance sheet. ("Ekonomicheskii potentsial gor i predgoriy ..., 1982").

The salt fields of Akbash, Tapaquton, Kaypangtov and Pachkamar have been identified in the southwestern branches of the Hissar ridge. The largest of them is the Tapaquton deposit, located 30 km northeast of the town of Dehqanabad. The estimated reserves of potassium salts in this deposit are 500 million tons, including 400 million tons of A+B+C categories. The depth of the layers ranges from 117 m to 936 m, the average thickness of the layer is 5.1 m, and it is observed in an area of 81 km².

On the basis of the Tapaquton potassium salt deposit, the production of potassium fertilizer was established with the participation of foreign investors. Complex processing of salts allows for the production of brominated iron, magnesite, gypsum and other materials on the go.

Within the southwestern branches of the Hissar ridge, in the Dehqanabad district, geologists of the TashSU (now the National University of Uzbekistan) have identified the presence of phosphorite deposits with estimated reserves of 213 million tons. Phosphorite deposits can be exploited in an open-pit manner. The content of R₂O₅ in the ore of this deposit is 6%. Continuing geological exploration in this area may allow finding richer ore deposits.

As a result of geological exploration, the Lolabulok pegmatite deposit was discovered on the slopes of the Koratepa Mountains, 30 km northeast of the city of Chiraqchi, with estimated reserves of pegmatite of 7 million tons.

On the slopes of the Koratepa Mountains are located the Dovtash and Kyzylbayrak manganese deposits. The reserves of the Dovtash deposit are 0.8

million tons, and the content of manganese in the deposits is 16.8%. Manganese deposits in the deposit can be mined in an open-pit manner. The Kyzylbayrak manganese deposit is a continuation of the Dovtash deposit in the east, and the deposits of this deposit can be used as microfertilizers in the metallurgical industry and agriculture.

Like other regions of Uzbekistan, the Kashkadarya region is very rich in various building materials. Among the mineral resources extracted in the region, non-precious minerals such as marble, dolomite, limestone, expanded clay, which are used for decoration, sculpture, and construction, rank second only to fuel and energy resources.

There are 20 marble mines in our country, of which Bodomzor, Iskana, Sevaz, Tomchata, Makrid, Khazornava, Birkunlik and others are located in the Kashkadarya region. Various types of marble are mined from these mines. The total reserves of marble in these mines exceed 4 million km³. Raw materials from the marble mines in the region are used to produce marble blocks and crushed stone at the Kitab and Makrid stone processing plants. The technological equipment of these plants was replaced with new equipment imported from foreign countries during the years of independence, and the production and product range were increased. Currently, there are opportunities for wider use of the wonderful properties of decorative facing stones mined in our region.

Conclusion. In conclusion, it can be said that Uzbekistan today independently and freely disposes of the natural resources on its territory, considering its national interests, the happiness and future of its people and descendants. This opportunity is the highest blessing and the greatest right granted by independence. In addition, these same resources are the material and economic basis of our independence and serve to build a democratic state and civil society based on the rule of law in our country.

References.

1. Абдуллаев С.И., Усманов И. Природные ресурсы Кашкадарьинской области и их хозяйственное использование// Природно - хозяйственная оценка территории Кашкадарьинской области. – Т.: 1980.
2. Мавлянов Г.А., Касимов С.М. Инженерно геологическая условия. Природные условия и ресурсы Юго-Западного Узбекистана. Т.: Наука. 1965, с. 105-123.
3. Suyunov A., Suyunov S., Khushmurodov F., Suyunov S., Omonov, I., Eshboev B. Ecological consequences of the desertification process in the agrolandscapes of the Kashkadarya oasis. In *BIO Web of Conferences* (Vol. 160, p. 02006). EDP Sciences. 2025.
4. Эшбоев Б.Т. Топонимы Кашкадарьинской области. - Монография. Узбекистан, Карши -2021.
5. Tojievich E. B., Geldiyarovich N. M. Explanation Of Oronyms And Orographic Terms Of Kashkadarya Region //Journal of Contemporary Issues in Business and Government. – T. 2021.

6. Eshboev B., Abduraimov B. Natural geographical problems of using the mountain and near-mountain areas of Kashkadarya region //Экономика и социум. – 2024. – №. 5-1 (120). – С. 275-278.
7. Eshboev B., Xalilova E. Formation of natural geographical processes under the influence of the geological and geomorphology characteristics of the areal //Экономика и социум. – 2024. – №. 3-1 (118). – С. 159-162.
8. Эшбоев Б.Т. Гидронимлар ва географик терминларнинг жой номларида акс этиши //Общества Узбекистана. – С. 117.
9. Eshboev B.T. The role of geographic terms definition high relief forms in the formation of oronyms. Proceedings of International Conference on Modern Science and Scientific Studies. France, Paris. Vol. 2. No. 4. 2023.
10. Bexzod E. Shoxboz Y. O'zbekiston oronimlarimg shakllanish xususiyatlari va lisoniy tahlili //Innovations in Technology and Science Education. – 2023. – Т. 2. – №. 8. – С. 697-701.
11. Tojiyevich E.B., Erkinovna K.M. Place names of the Kashkadarya region associated with climatic and meteorological features //Zbiór artykułów naukowych recenzowanych. – С. 51.
12. Eshboev B.T., Xudoyberdiev J.J. Relations of place names of Kashkadarya region with microclimate //Экономика и социум. – 2023. – №. 10 (113)-2. – С. 108-111.

OILA MUHITIDA OTA-ONA MUNOSABATLARINING BOLA SHAXSINI SHAKLLANTIRISHDAGI ROLI

Annotatsiya: Maqolada oiladagi ota-ona munosabatlarining bolaning shaxs sifatida shakllanishiga ko'rsatadigan ta'siri tahlil qilinadi. Tadqiqotda o'zbek oilalariga xos tarbiyaviy an'analar, zamonaviy psixologik yondashuvlar hamda ota-onaning shaxsiy namunasi masalalari yoritilgan. Oilaviy muhitda hukm suradigan ruhiy barqarorlik, intizom, mehr-oqibat va talabchanlikning bola ijtimoiy faolligi, axloqiy qarashlari va psixologik yetukligiga ta'siri asoslab berilgan. Shuningdek, maktab, oila va jamoatchilik hamkorligining tarbiyadagi o'rni ochib beriladi.

Kalit so'zlar: ota-ona munosabatlari, oila tarbiyasi, psixologik muhit, shaxsiy namuna, o'zbek oilasi, axloqiy tarbiya, bola rivoji.

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THE ROLE OF PARENTAL RELATIONSHIPS IN SHAPING A CHILD'S PERSONALITY WITHIN THE FAMILY ENVIRONMENT

Abstract: This article analyzes the impact of parental relationships within the family on the formation of a child's personality. The study highlights upbringing traditions characteristic of Uzbek families, modern psychological approaches, and the significance of parents' personal example. It substantiates the influence of psychological stability, discipline, care, emotional warmth, and reasonable parental demands within the family environment on a child's social activity, moral values, and psychological maturity. In addition, the role of cooperation between the family, school, and community in the educational process is emphasized.

Keywords: parental relationships, family upbringing, psychological environment, personal example, Uzbek family, moral education, child development.

Oila jamiyatning eng muhim ijtimoiy-tarbiyaviy institutlaridan biri hisoblanadi. Insonning ma'naviy-axloqiy qiyofasi, ijtimoiy xulqi va hayotga bo'lgan munosabati, avvalo, oiladagi tarbiyaviy muhit orqali shakllanadi. Bola hayotidagi dastlabki bilimlar, xulq me'yorlari va qadriyatlar aynan oila doirasida singdiriladi. Shu sababli ota-onaning o'zaro munosabati, tarbiyaga bo'lgan yondashuvi va shaxsiy xulqi bolaning kelajakdagi hayot yo'liga bevosita ta'sir ko'rsatadi.

Zamonaviy jamiyatda tarbiya masalasi faqat an'anaviy qarashlar bilan cheklanib qolmasdan, psixologik va pedagogik yondashuvlar bilan boyitilmoqda. Ushbu maqolada ota-ona munosabatlarining bolalar tarbiyasiga ta'siri, psixologik pozitsiyalar, milliy xususiyatlar va zamonaviy tarbiya usullari tahlil qilinadi.

Psixologiya fanida oila ichidagi munosabatlar shaxsning turli psixologik pozitsiyalar orqali namoyon bo'lishi bilan izohlanadi. Ushbu pozitsiyalar tarbiya jarayonida muhim ahamiyatga ega.

Ota-onaning o'rnida bo'lgan shaxs nazorat, talabchanlik va mas'uliyatni o'z zimmasiga oladi. U bolaga nisbatan:

- ✓ qat'iy talab qo'yadi;
- ✓ tartib-intizomni ta'minlaydi;
- ✓ rag'bat va jazo mexanizmlaridan foydalanadi.

Mazkur xolatda tarbiya jarayonida zarur bo'lsa-da, ortiqcha bosim bola ruhiyatiga salbiy ta'sir ko'rsatishi mumkin.

Shu holatda "kattalarning" o'zni maqbul va sog'lom tarbiyaviy yondashuv hisoblanadi. Bu holatda ota-ona bola bilan tenglik asosida muloqot qiladi, mas'uliyatni bo'lishadi va qarorlarni ongli ravishda qabul qiladi. Ushbu yondashuv bolaning mustaqil fikrlashi va o'ziga bo'lgan ishonchini rivojlantiradi.

Mazkur holat hissiylik, ishonuvchanlik, mehrga ehtiyoj va tez ta'sirchanlik bilan tavsiflanadi. Agar ota-ona ushbu pozitsiyada qolib ketsa, tarbiyaviy jarayonda barqarorlik buziladi.

Oilada ushbu pozitsiyalarning muvozanatda bo'lishi sog'lom psixologik muhitni ta'minlaydi.

O'zbek xalqining tarbiyaviy qarashlari asrlar davomida shakllangan bo'lib, ular milliy urf-odatlar, diniy qadriyatlar va ijtimoiy me'yorlarga asoslanadi. An'anaviy tarbiya usullari quyidagilarni o'z ichiga oladi:

- ✓ tushuntirish va ishontirish;
- ✓ nasihat berish;
- ✓ shaxsiy namuna ko'rsatish;
- ✓ rag'batlantirish va tanbeh berish;
- ✓ jamoatchilik ta'siri.

Bugungi kunda esa bolani shaxs sifatida hurmat qilish, uning qiziqish va qobiliyatlarini rivojlantirishga yo'naltirilgan demokratik tarbiya usullari keng qo'llanilmoqda.

Bunday sharoitda oiladagi ruhiy barqarorlik va iliq munosabatlar bolaning psixologik rivojlanishi uchun asosiy omil hisoblanadi.

Mehr-muhabbat va o'zaro hurmat hukm surgan oilada ulg'aygan bola o'ziga ishongan, tashabbuskor va ijtimoiy faol bo'lib voyaga yetadi.

Ota va onaning talablarida uyg'unlik bo'lishi bolaning axloqiy qarashlari barqaror shakllanishiga xizmat qiladi.

Bolani mehnatga jalb qilish orqali unda mas'uliyat, mustaqillik va intizom tuyg'ulari rivojlanadi.

Oilada aniq belgilangan rejim va ichki tartib bolaning hayotini tizimli tashkil etishga yordam beradi. Rejim:

- ✓ bilim olish samaradorligini oshiradi;
- ✓ sogʻlom turmush tarzini shakllantiradi;
- ✓ tartiblilik va masʻuliyatni mustahkamlaydi.

Eng muhim jihat shundaki, ota-onaning oʻzi rejimga amal qilishi bola uchun eng kuchli namuna hisoblanadi.

Tarbiyada eng samarali vosita bu — shaxsiy namuna. Ota-onaning kundalik xulqi, muomalasi, mehnatga munosabati va axloqiy qarashlari bola ongida chuqur iz qoldiradi.

Samarali tarbiya usullari:

- ✓ ibrat-namuna koʻrsatish;
- ✓ tushuntirish va suhbat;
- ✓ ragʻbatlantirish;
- ✓ vaziyatga mos tanbeh;
- ✓ diniy va axloqiy oʻgitlar.

Ota-onaning oʻzaro hurmatga asoslangan munosabati bolaning ijtimoiy xulqini shakllantiradi. Bunday oilada ulgʻaygan bolada ijobiy muloqot koʻnikmalari rivojlanadi. Aksincha, doimiy nizolar hukmron boʻlgan muhit bola ruhiyatida qoʻrquv va ishonchsizlikni yuzaga keltiradi.

Xulosa qilib aytganda, oila bola tarbiyasining asosiy manbai hisoblanadi. Ota-onaning oʻzaro munosabati, tarbiyaga boʻlgan masʻuliyati va shaxsiy namunasi bolaning kelajakdagi shaxs sifatida shakllanishini belgilaydi. Tarbiyada mehr-oqibat va talabchanlik uygʻunligi, intizom va axloqiy qadriyatlarning birligi sogʻlom va barkamol avlodni voyaga yetkazishning muhim sharti hisoblanadi.

Foydalanilgan adabiyotlar

1. Abdullaev M. Madaniyat va maʼnaviyat masalalari. – Toshkent: Muloqot, 1998.
2. Abdullajonova D. Milliy xotira va ijtimoiy ong // Jamiyat va boshqaruv. – 2004.
3. Abduraxmonov A. Axloqiy tarbiya va milliy qadriyatlar // Sharq yulduzi. – 1990.
4. Toshxonov L.T. Taʼlim jarayonida innovatsion yondashuvlar. – Andijon, 2016.

WHY TIME MANAGEMENT IS IMPORTANT FOR STUDENTS IN LEARNING A FOREIGN LANGUAGE

Abstract: *In this article, we'll explore some practical, proven techniques that can transform your study habits and boost your productivity. We'll help you find the perfect strategy for managing your academic life, from traditional methods to advanced time management tools.*

Key words: *Time management, students, effectiveness, balance, self-control, educational purpose, digital tools, foreign languages.*

Student time management isn't about trendy color-coded schedules or the latest productivity apps. The ideal system should align with your study habits and academic needs. Perhaps you're trying to juggle multiple assignments, extracurricular activities, or maintain a healthy work-life balance. Becoming a master of time management is a crucial part of academic success. The best part? Your entire routine doesn't need to be changed overnight.

Time management skills do more than just help you meet deadlines - they lay the foundation for success in your studies and personal life. Students who manage their time well consistently perform better academically.

Time management skills are vital to your academic journey because:

- ◆ Increased productivity: Good time management sets you up for greater work output and greater effectiveness;

- ◆ Improved decision-making: A relaxed mind helps you make smarter choices about your studies;

- ◆ Reduced stress: Students who manage their time well feel less anxious about their studies;

- ◆ Improved work-life balance: Smart planning helps you balance your studies and your personal life;

- ◆ Improved self-discipline: Time management demonstrates and builds self-control;

Academic life involves many moving parts—from classes to assignments and exam preparation. These tasks can quickly become overwhelming without proper planning. Students who organize and prioritize their work stay on top of their assignments and avoid procrastination.

Time management acts as your academic compass. A well-managed schedule allows you to better focus on each task. You complete projects on time and better understand the course material thanks to this focused approach.

Good time management does more than just improve your grades. Students who use effective time management strategies enjoy better physical health and experience less stress. Clear priorities and well-designed schedules help you maximize productivity and reduce wasted time.

Your brain releases dopamine after completing your most challenging task. Scientists call this "high sense of accomplishment." Behavioral studies show that completing a task improves your ability to handle other important work. This dopamine release improves attention, memory, and motivation.

Break complex projects into smaller steps to maintain this momentum. You'll feel a sense of accomplishment from completing each step as you manage complex work.

Students today have more digital tools for managing their time than ever before. The right digital tools can transform your schedule into a smoothly functioning system that keeps you focused throughout your academic life.

Time-blocking apps allow you to set specific time slots for tasks and events. Google Calendar remains a simple yet powerful tool that helps organize your weekly schedule of activities and events. Motion goes a step further. It schedules your tasks around existing commitments and automatically adjusts them when conflicts arise.

Key features of modern time-blocking apps include:

- ◆ Calendar integration across devices
- ◆ Automatic task scheduling

- ◆ Smart reminder systems
- ◆ Collaboration features for group projects
- ◆ Visual planning tools

Small tasks can quickly pile up during your study time. The two-minute rule provides a simple yet effective solution that prevents this accumulation and improves your productivity. This technique is straightforward: if a task takes less than two minutes, do it now instead of putting it off.

A Quick Task Management Strategy. This rule works because it's simple: complete any task immediately if it takes less than two minutes. Students can apply it to:

- ◆ Responding to study group messages
- ◆ Journaling study notes
- ◆ Setting assignment reminders
- ◆ Adding due dates to the calendar
- ◆ Organizing study materials

You need to transform your tracking data into actionable insights for improvement. Large amounts of data help you make smarter decisions about your study habits. The goal of tracking is to show progress, not perfection. You should focus on the big picture of your time allocation, rather than tracking every minute. This helps you identify patterns and adjust your study routine accordingly.

Look for ways to optimize your schedule when reviewing your productivity data. Students using analytical time management report higher task completion rates. This information helps you fine-tune your study techniques and create better time management strategies.

Productivity Tracking Apps. RescueTime stands out as a powerful tool that monitors your device usage in the background. You receive detailed reports on your study time, helping you identify and eliminate distractions.

The Brain Focus productivity timer supports you by setting specific time blocks for studying and breaks. This well-designed method helps you stay focused during study sessions and take breaks to avoid burnout.

Questions that may arise about time management techniques:

◆ How can technology help with time management for students?

Technology can significantly improve time management through apps and tools such as digital calendars for planning, time tracking apps for monitoring productivity, mind mapping software for visual planning, and task management platforms that use AI to optimize your schedule. These digital solutions can help automate routine tasks and provide insights into your study habits.

◆ What is the "two-minute rule" and how can it be helpful for students?

The two-minute rule states that if a task takes less than two minutes to complete, you should do it immediately rather than procrastinate. This technique helps prevent the accumulation of small tasks, reduces mental clutter, and creates momentum for completing larger assignments. It is especially useful for quick administrative tasks related to your teaching.

◆ How can students balance their time between different subjects and assignments?

Students can balance their workload using techniques such as time blocking to allocate specific periods for each subject, and using batch processing to group similar tasks together. Regularly reviewing and adjusting your schedule based on changing priorities is also important.

◆ Why is tracking productivity metrics important for students?

Tracking productivity metrics helps students understand where their time is really spent, identify patterns in their study habits, and make data-driven decisions to improve time management. By tracking key performance indicators such as assignment completion rates and study session length, students can optimize their routines for better academic success and reduced stress.

Conclusion

Becoming a master of time management can make your academic experience less daunting and more manageable. Different techniques offer unique advantages. Your study style and specific needs will determine which methods work best. The key is to start with one simple technique, such as the two-minute rule or time boxing. You can add more techniques as you feel comfortable. Tracking your productivity shows you exactly how to adjust your study habits for better results.

List of literature used:

1. Altaytsev A.M., Naumov V.V. Educational and methodological complex as a model for organizing educational materials and distance learning tools. In the book: University education: from effective teaching to effective learning (Minsk, March 1-3, 2001) / Belarusian State University. Center for Education Development Problems. - Minsk, Propylaea, 2002. - 288 p., pp. 229-241.
2. Kovalevsky I. Organization of independent work of students // Higher education in Russia No. 1, 2000, pp. 114-115.
3. Novikov, D. A. Introduction to the Theory of Educational Systems Management /D. A. Novikov. - M.: Egves, 2009.- 156 p.
4. Irgashev M.U. General characteristics of of consecutive and simultaneous interpretation. Журнал «Экономика и социум». 1(128) -2025. 8-12 p.
5. Irgashev M.U. The use of computer technologies and Internet resources in teaching vocabulary to students. Журнал «Экономика и социум». 10(125) -2024. 8-12 p.
6. Time Management Skills. [Электронный ресурс]. URL: <https://www.skillsyouneed.com/ps/time-management.html> (дата обращения: 20.02.21).

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PO‘LAT O‘TKAZGICHLI TARMOQLARDA QISQA TUTASHUV TOKLARINI HISOBLASH

Annotatsiya : Ushbu maqolada po‘lat o‘tkazgichli elektr tarmoqlarida yuzaga keladigan qisqa tutashuv toklarini hisoblash usullari ko‘rib chiqiladi. Po‘latning elektr xossalari va ularning tarmoqning umumiy impedansiga ta’siri tahlil qilinadi. Qisqa tutashuv holatida tokning taqsimoti, issiqlik ajralishi va kuchlanish pasayishi kabi omillar ham yoritiladi. Hisoblash usullarining aniqligi va amaliy qo‘llanishi muhokama qilinadi.

Kalit so‘zlar: qisqa tutashuv, po‘lat o‘tkazgich, elektr tarmog‘i, tok taqsimoti, impedans, issiqlik ajralishi.

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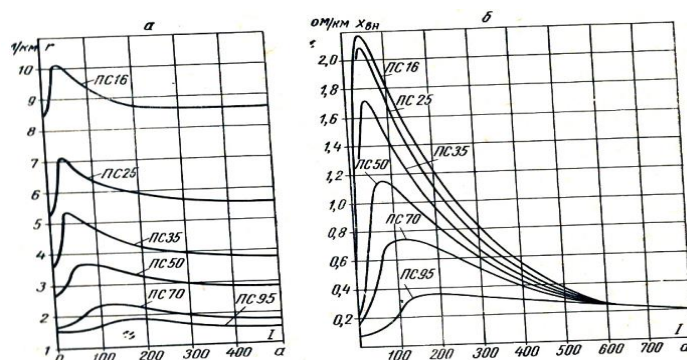
CALCULATION OF SHORT-CIRCUIT CURRENTS IN NETWORKS WITH STEEL CONDUCTORS

Abstract: This article examines methods for calculating short-circuit currents in electrical networks using steel conductors. The electrical properties of steel and their impact on the network's overall impedance are analyzed. Factors such as current distribution, heat dissipation, and voltage drop during short-circuit conditions are also explored. The accuracy and practical applicability of the calculation methods are discussed.

Keywords: short circuit, steel conductor, electrical network, current distribution, impedance, heat dissipation

Elektr energiya ta'minoti tizimidagi favqulotda buzilishlar doimo tizimni barcha elementlarida elektr va mexanik o'tish jarayonlarini sodir bo'lishiga olib keladi. Bunday jarayonlar tizim elementlariga salbiy ta'sir ko'rsatib ularni ishdan chiqishiga, natijada elektr ta'minotini uzilib qolishiga sabab bo'ladi. Qishloq xo'jaligi elektr ta'minotida qo'llaniladigan po'lat o'tkazgichlarda qisqa tutashuv toklarini sodir bo'lishi shuningdek o'tish jarayonlarini xisobga olgan holda ularni xisoblash masalalariga to'xtalib o'tamiz..

Qishloq xo'jaligi iste'molchilarini elektr ta'minotida qo'llaniladigan po'lat o'tkazgichlarni farqli xususiyatlariga ba'zi holatlarda ularni aktiv va induktiv qarshiliklarini oqayotgan tokga bog'liqligi hisoblanadi. Bunga sabab bo'lib, tok kattaligiga bog'liq bo'lgan katta magnit o'tkazuvchanligiga ega bunday o'tkazgichdagi ichki magnit maydoni hisoblanadi. Shuning uchun po'lat o'tkazgichli tarmoqlarda qisqa tutashuv toklarini hisoblash murakkablashadi. Bunday holatlarda toklarni hisoblash uchun po'lat o'tkazgichli tarmoqlarni ustlash sxemalariga ba'zi bir tarmoq qarshiligini kiritish kerak bo'ladi. Ammo bu qarshilik noma'lum, chunki u qisqa tutashuv tokni izlanayotgan kattaligiga bog'liq. (1-rasm).



1-rasm. Ko'p tolali po'lat o'tkazgichli o'tkazgichlarni aktiv (a) va ichki induktiv (b) qarshiliklarini tokka bog'liqligi.

Po'lat o'tkazgichlar qarshiliklarini tok kuchiga bog'liqligini hisobga olmaslik hatoga olib kelishi mumkin, chunki u 40-50% ni tashkil qiladi. Shuning uchun ko'pincha bu bog'lanishni ularni hisobga olish kerak bo'ladi.

Bu muammoni oydinlashtirish uchun oddiy sxemani ko'rib chiqamiz (2 rasm) Hisoblaymiz, po'lat o'tkazgichli tarmoq cheksiz katta quvvatli manbaadan ta'minlanadi, uning ichki qarshiligi $x=0$



2-rasm. Po'lat o'tkazgichli tarmoqdagi qisqa tutashuv tokini hisoblash usuli uchun sxema.

Tarmoqdagi tok kattaligi xisobga olinmagan holda bu manbaani chiqishlaridagi kuchlanishni o'zgarmas deb hisoblaymiz; ya'ni $U = \text{const}$

O'tkazgich qarshiligini tok kuchiga bog'liqligini ma'lum bog'liklarida K nuqtada qisqa tutashuvda tok qiymatini aniqlaymiz:

$$X_0 = f(I); \quad r_0 = f(I); \quad Z_0 = f(I)$$

Bu masalani ketma-ketli taxminiy usul bilan yechish mumkin. Masalan; me'yoriy rejimda avariya sabab bo'ladigan va tok I_1 qiymatiga mos keladigan r_{01} om/km va x_{01} om/km qarshiliklarni ba'zi bir qiymatlari beriladi. Bunda tarmoqni l km uzunligidagi qisqa tutashuv toki kattaligi quyidagicha aniqlanadi.

$$I_k = \frac{U_f}{l \sqrt{r_0^2 + x_0^2}} = I_2$$

Topilgan tok kuchi I_2 ga mos keladigan qarshilikning qiymatlari qabul qilinib hisob-kitob qayta amalga oshiriladi va tokning yangi qiymati I_2 topiladi, so'ngra unga mos keladigan x_0 va r_0 qiymatlari (1) formulaga qo'yiladi va x.k.z.

Hisoblashlar qisqa tutashuv tokining ma'lum bo'lgan va izlanayotgan qiymatlariga mos tushguniga qadar qaytarilaveradi.

Bunday hisoblashlarning o'ta qulay usuliga grafoanalitik usul kiradi. Uning mohiyati [1] da keltirilgan.

Berilgan zanjirni 3-4 nuqtalari uchun

$$I_{zk} = I_{z0} = f(I) \text{ bog'lanish quriladi,}$$

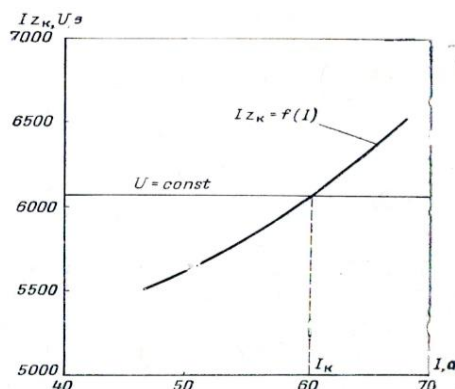
ammo tok kuchining har bir qiymati uchun unga mos keladigan $Z_0 = \sqrt{r_0^2 + x_0^2}$ qiymati olinadi. (3-rasm)

Qisqa tutashuv toki keltirilgan bog'lanishni $U_\phi = \text{const}$ to'g'ri chizig'ini kesishgan nuqtasi absitsasi kabi topiladi.

Keltirilgan grafoanalitik usul bir turli bo'lmagan tarmoqlar uchun ham tarqatilishi mumkin, ya'ni turli kesim yuzali uzatgichlar va tarkibida qarshiligi tok kuchiga bog'liq bo'lmagan elementlari kiritilgan zanjirlar uchun ham.

$$I_{zk} = I \sqrt{(\sum_1^n r_i)^2 + (\sum_1^n x_i)^2} = f(I)$$

Bunday hollarda quyidagi bog'lanish quriladi:



3-rasm. $I_{zk} = f(I)$ bog'lanish grafigi.

bu yerda r_i , x_i - mos ravishdagi tok I ni qiymatlarida sxemani ketma-ket ulangan n elementlarini har birini aktiv va induktiv qarshiliklari.

Bunday holatlarda ham QT tokini kattaligi bog'lanishni (2) $U_\phi = \text{const}$ to'g'ri chizig'i bilan k esishgan nuqtasi kabi topiladi (3-rasm)

Agarda QT zanjirida kuchlanishni turli pog'onalari mavjud bo'lsa, unda barcha qarshiliklar bitta pog'onaga keltirilishi kerak bo'ladi.

$I_{zk}=f(I)$ bog'lanishi qurishda po'lat o'tkazgichlarni qarshiliklari mazkur pog'onaning haqiqiy tokiga mos kelishi kerak.

Ko'rsatilgan shartga amal qilinganda hisob-kitoblar nisbiy birliklarda bajarilishi mumkin. Hisoblar hajmini kamaytirish uchun hisob-kitoblarda po'lat o'tkazgichni qarshiligini ikkita chegaraviy qiymatlaridan foydalanish mumkin, ya'ni minimal va maksimal. Ularga mos keladigan QT toklarini analitik yoki berilgan rejim va vaqt momenti uchun hisobiy egri chiziq bo'yicha aniqlanadilar. Mazkur tok $I_{zk}=f(I)$ bog'lanishni qurish uchun foydalaniladi.

Grafik usuldan foydalanish mumkin, qachonki po'lat o'tkazgichli tarmoqni oxirgi quvvatli tizimdan ta'minlanganida. Bunda $U=\text{const}$ to'g'ri chiziq o'rniga $E=\text{const}$ to'g'ri chizig'ini qo'llash lozim, bunda E_{ek} -ekvivalent natijaviy EYUK, ketma-ket vaqt momentlari uchun ustlash sxemasini o'zgartirilgandagi hisoblangan.

Imkoni bor eng katta, yoki uni teskarisi imkoni borlardan eng kichkinasi QT nuqtasidagi toklarni aniqlashda po'lat o'tkazgichlar qarshiligini tokka bog'liqligini aniq hisobga olishni zaruriyati yo'q va hisob-kitoblar taxminiy bajarilishi mumkin.

Eng katta qisqa tutashuv tokini aniqlashda po'lat o'tkazgichlar qarshiligini ishchi tokka mos kelishini qabul qilish mumkin. Eng kichkina tokning qiymatini aniqlashda esa bu qarshilikni eng katta deb qabul qilish mumkin. (1-rasm)

Ko'pchilik qishloq elektr ta'minotida po'lat o'tkazgichli tarmoqlar qarshiligi QT zanjirini umumiy qarshiligini oz qismini tashkil qiladi. Bunday hollarda po'lat o'tkazgichlar tavsiflarini chuqur hisobga olishni zaruriyati yo'q. Hisoblashlarni taxminiy olib borish mumkin. O'tkazgichlarni har bir markasi uchun qarshiliklarni ba'zi bir o'rta qiymatlarini qabul qilish mumkin.

1-jadval. Po'lat o'tkazgichlarni aktiv va ichki induktiv qarshiliklarini o'rtacha qiymatlari.

O'tkazgich rusumi	Qarshiliklarni o'rtacha qiymatlari (Om/km)	
	r	X_{vn}
ПС 95	1.7	0.2
ПС 70	2.1	0.5
ПС 50	3.4	0.8
ПС 35	4.5	1.2
ПС 25	6.2	1.4
	9.0	4.6
ПС 05 (ЖС)	11.0	5.6
ПС 04 (ЖЧ)	13.0	5.6
ПС 03,5	17.0	5.6

Hisoblashlarda jadvalda keltirilgan ichki induktiv qarshiliklarni oʻrtacha qiymatlariga poʻlat oʻtkazgichlarni tashqi induktiv qarshiligini qoʻshib qoʻyish kerak.

Hulosa qilib shuni aytish mumkinki poʻlat oʻtkazgichli tarmoqlarda qisqa tutashuv tokini aniqlashda ulardagi qarshiliklarni tokka bogʻliqligini hisobga olish zarur.

Foydalanilgan adabiyotlar.

1. М.С.Левин и А. М. Ганелин. Графический метод расчета токов к.з в сетях со стальными проводами. «Электричество», №4, 2001
2. С.А.Бургучев. Электрические станции, подстанции и системы. Издательство «Колос», Москва. 2003
3. Б.М. Беркович, И.И. Леонтович Электрические сети и системы Москва: Высшая школа, 2002.
4. IEEE Std 551-2006 (IEEE Red Book) Recommended Practice for Calculating Short-Circuit Currents in Industrial and Commercial Power Systems Institute of Electrical and Electronics Engineers (IEEE), 2006.

TRADE FACILITATION THROUGH AEO MUTUAL RECOGNITION ARRANGEMENTS: EVIDENCE FROM THE LOGISTICS PERFORMANCE INDEX

Abstract: *This study empirically examines the relationship between the expansion of Authorized Economic Operator (AEO) Mutual Recognition Arrangements (MRAs) and a country's logistics performance. The main objective of the research is to identify the interrelationship between the number of MRAs and key Logistics Performance Index (LPI) outcomes, with particular attention to customs efficiency, and to assess whether wider MRA networks are associated with improved logistics rankings. For this purpose, a cross-country statistical dataset was compiled using the latest internationally comparable LPI edition (2023) and corresponding MRA information. The empirical analysis applies correlation-based methods and visual diagnostics (scatter plots and trendlines) to evaluate the direction and strength of the association between MRA coverage and LPI performance. The results indicate that a broader MRA network is associated with better logistics outcomes and improved customs-related rankings, although cross-country differences remain significant. The findings provide both theoretical and practical implications for strengthening trade facilitation policies, enhancing the operational effectiveness of MRAs, and improving the institutional mechanisms that support reliable and predictable cross-border supply chains.*

Keywords: *Authorized Economic Operator (AEO); Mutual Recognition Arrangement (MRA); trade facilitation; customs efficiency; Logistics Performance Index (LPI); WCO SAFE Framework; supply chain security; risk management; cross-border cooperation; Utility Block (UB).*

1. Introduction

An increase in foreign trade volumes expands the scale of production, boosts foreign currency earnings, strengthens competitiveness, and creates new jobs. Therefore, establishing a favorable organizational and legal environment for entrepreneurs engaged in export and import activities is highly relevant. In international trade operations, differences in rules governing the movement of goods, customs clearance procedures, border controls, required documentation, and risk management mechanisms lead to bureaucratic barriers and additional costs. As a result, time losses occur, logistics costs rise, disruptions emerge in supply chains, and business risks intensify.

To harmonize trade procedures and create a predictable environment for trusted business operators, countries conclude bilateral and multilateral agreements.

Such arrangements strengthen interstate cooperation, align regulatory requirements, and expand businesses' opportunities to access international markets.

Within the framework of the WCO SAFE Framework, the AEO concept and Mutual Recognition Arrangements (MRAs) serve as important instruments. An MRA provides that an AEO status granted by the customs administration of one country as "trusted" is also recognized by the partner country, and that reciprocal facilitation benefits are provided to AEOs. This article examines whether an increase in the number of MRAs may influence the Logistics Performance Index (LPI), which reflects a country's logistics efficiency. In particular, it advances the hypothesis that such an effect may be reflected through positive changes in the "customs efficiency" component.

Literature Review.

Numerous studies have been conducted on this topic. Tuan Pham examined the factors influencing MRA negotiations for AEO programmes and, as a result, proposed the MRA Development Model to facilitate both bilateral and multilateral negotiations. This model was developed to support trade facilitation and secure global supply chains.[1]

Nkhahle and Baldavoo conducted an analysis of the implementation of the WCO SAFE Framework within the SARS, with particular emphasis on the AEO programme. The results noted that AEO compliance had increased and trade facilitation had improved in South Africa. [2]

Hanafi Amin Firdaus analysed the introduction of the Mutual Recognition Arrangement for Authorised Economic Operators (MRA AEO) between Indonesia and the UAE and its implications for economic growth. According to the research findings, the MRA AEO simplifies export-import operations. It was noted that the MRA AEO reduces complex procedures in customs clearance for entities with AEO status, lowers the proportion of inspections, and contributes to saving time in clearance procedures. It was also noted that this mechanism has a positive impact on foreign trade activity by reducing logistics costs and increasing the efficiency of processes. [3]

Chang-Bong Kim, Il-Sok Chung and Hye-Young Joo examined the impact of the AEO MRA on the efficiency of exporters and importers in Korea using a structural equation model on a sample of companies. The results show that annual trade volume amplifies the effect of the AEO MRA. They demonstrated that the impact of the AEO MRA enhances logistics efficiency and does not directly affect operational efficiency, and that if logistics cooperation is low, the AEO MRA's effect on logistics efficiency may go unnoticed.[4]

Fazliddin Elmurodovich Khujayev analysed the development of transport infrastructure in states through the dynamics of freight and passenger traffic. The analyses have demonstrated that the problems in this area can be resolved by creating a single integrated transport space based on advanced infrastructure. Infrastructure-level disparities and the low degree of unification of regulatory and legal documents were identified as factors constraining integration.[5]

2. Materials and Methods.

This study empirically assesses the relationship between the extent of AEO MRAs and a country's logistics performance. The empirical design is based on a one-year cross-sectional comparison (2023), because the latest internationally comparable Logistics Performance Index (LPI) results reported by the World Bank correspond to the 2023 edition.[6] To measure the strength and direction of linear association between MRAs and LPI indicators, the analysis applies the Pearson correlation coefficient (r), which ranges from -1 to $+1$. The coefficient is defined using the standard Pearson correlation formulation between the country-level MRA count and the selected LPI rank indicators. All computations were carried out in MS Excel using the CORREL function, and statistical significance was evaluated via t -statistics. For visual interpretation, the relationship between MRA counts and the LPI grouped rank was illustrated using a scatter plot with a fitted trendline and corresponding goodness-of-fit measure.

3. Results and Discussion

MRA is an agreement concluded between customs administrations within the framework of the WCO SAFE Framework, which—based on the similarity/equivalence of the parties' AEO programmes (security criteria and validation procedures) - provides that an AEO status granted by one party is also recognized by the other party, and that, in return, reciprocal facilitation benefits are granted to AEOs.

Table 1. Most countries with the highest number of MRAs (2026)

№	Country	Launch date	Number of MRAs	Number of AEOs	Number of AEOs recognized under MRAs
1	China	2021	34	5882	4542
2	India	2011	28	5720	1147
3	Republic of Korea	2009	27	845	268
4	Hong Kong	2012	20	81	81
5	United States	2001	20	11020	498
6	South Africa	2021	17	177	177
7	Saudi Arabia	2018	16	406	406
8	Singapore	2007	15	84	84
9	Australia	2016	14	900	900
10	Brazil	2014	14	581	441

The number of MRAs and AEOs is updated on a quarterly basis; therefore, the figures presented in the table may vary slightly depending on the reporting period. WCO Online AEO Compendium (OAC)

The data in Table 1 above shows that China holds the leading position in terms of the number of mutual recognition agreements (MRAs) on AEO status: the country has established cooperation with 34 states under MRAs. The AEO programme in China was implemented in 2021, and the registration of 5,882 AEO entities in a short period demonstrates the growing institutional appeal and scope of application of the system. Furthermore, according to the table, the number of AEO recognised under the MRA in China is 4,542.

The next leading country is India, where the AEO programme has been in operation since 2011. According to data for the study period, 5,720 AEOs have been registered in India, of which 1,147 have been recognised under the MRA. Furthermore, as India has established MRA with 28 countries, national AEO entities are also able to benefit from simplified procedures in partner countries.

Overall, the table shows that a significant share of the entities that systematically develop their AEO programme and expand their MRA network are relatively economically developed countries. In this context, a higher number of MRAs is often closely associated with effective customs risk management systems, supply chain security requirements, institutional capacity, and an active level of international cooperation.

At the same time, it is natural for a gap to exist between the total number of AEOs and the number of AEOs recognized under MRAs. Within bilateral arrangements, the parties mutually agree - based on their national legal requirements and the structure of their AEO programmes - whether facilitation benefits and special simplifications will apply to all AEOs or only to specific categories (groups) of AEOs. As a result, the coverage of AEOs and the share of AEOs granted cross-border recognition through MRAs differ from one country to another.

Within the European Union, the AEO system also occupies a distinct position. The EU AEO programme was developed on the basis of the WCO SAFE approach and has been fully operational since 1 January 2008. The main principle of the EU is that even if AEO status is granted by the customs authority of one Member State, it is recognised throughout the Union, and economic operators can benefit from AEO privileges in all Member States. Currently, there are over 18,437 AEOs operating across the European Union, and 8 MRAs have been concluded.

Above, the content of MRA for AEO status and their mechanisms for influencing international trade processes were outlined. However, when assessing the practical effectiveness of MRAs, it is important not to be limited to their normative-legal existence, but also to determine empirically to what extent these agreements are reflected in the outcomes of the logistics system. To this end, the study adopts the Logistics Performance Index (LPI) as the international indicator that comprehensively represents the efficiency of countries' customs and logistics systems. The LPI determines a country's logistics efficiency ranking through indicators such as customs efficiency, quality of infrastructure, international freight shipments, logistics service capabilities, quality of tracking and monitoring, and on-time delivery. This allows for the analysis of the correlation between the number of MRAs and logistics outcomes.

Improving customs efficiency can be achieved by increasing the number of AEOs, while expanding the number of MRA agreements can contribute to attaining the targeted outcomes reflected in the LPI indicators. This gives rise to the hypothesis that a higher number of MRAs is associated with an improvement in a country's LPI ranking. To test and substantiate this hypothesis, a correlation analysis was conducted to examine the relationship between the increase in the number of MRAs and improvements in LPI performance.

In this study, data were compared based on the 2023 situation in order to assess the relationship between MRA agreements and logistics performance. The rationale for choosing 2023 is that the most recent internationally available LPI results published by the World Bank refer to the 2023 edition, and this index serves as the only up-to-date, comparable database for cross-country benchmarking.

Only those countries for which both MRA and LPI indicators were fully available for 2023 were included in the comparison (sample: 81 countries). Accordingly, the analysis follows a “one year—one cross-section” approach, aiming to quantify the statistical association between the number of MRAs and LPI outcomes (in particular, indicators related to customs performance).

The Pearson correlation coefficient (r) was applied. This coefficient measures the strength of a linear relationship between two variables on a scale from -1 to $+1$, where $r > 0$ indicates a positive association and $r < 0$ indicates an inverse association. Calculations were performed in MS Excel using the CORREL function, and statistical significance was assessed using t-statistics. The sample size was $N = 81$ countries.

In the analysis, the main independent variable (X) was the number of MRA agreements. The dependent variables (Y) were rank-based indicators constructed from LPI 2023 results: the overall LPI grouped rank, customs grouped rank, logistics competence and quality grouped rank, and timeliness grouped rank. A key methodological point is that for rank indicators, lower values represent better performance (i.e., rank 1 is the best). Therefore, if an increase in the number of MRAs is associated with an improvement in ranking positions, the expected correlation coefficient is negative ($r < 0$)—which is interpreted in this context as a positive effect in terms of improved performance.

To assess the strength of the linear relationship between the number of MRA agreements and LPI indicators, the Pearson correlation coefficient was applied. It is calculated using the following formula:

$$r_{XY} = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2} \sqrt{\sum_{i=1}^n (y_i - \bar{y})^2}}$$

Where:

r_{XY} - Pearson correlation coefficient;

x_i - the number of MRA agreements for the i -th country;

y_i - the LPI indicator value for the i -th country;

$\bar{x}$, $\bar{y}$ - the corresponding mean values, respectively.;

n — the number of countries (sample size).

To facilitate a visual interpretation of the correlation analysis results, the relationship between the number of MRA agreements and the LPI grouped rank was illustrated using a scatter plot. The obtained results are presented in the following figure (Figure 1).

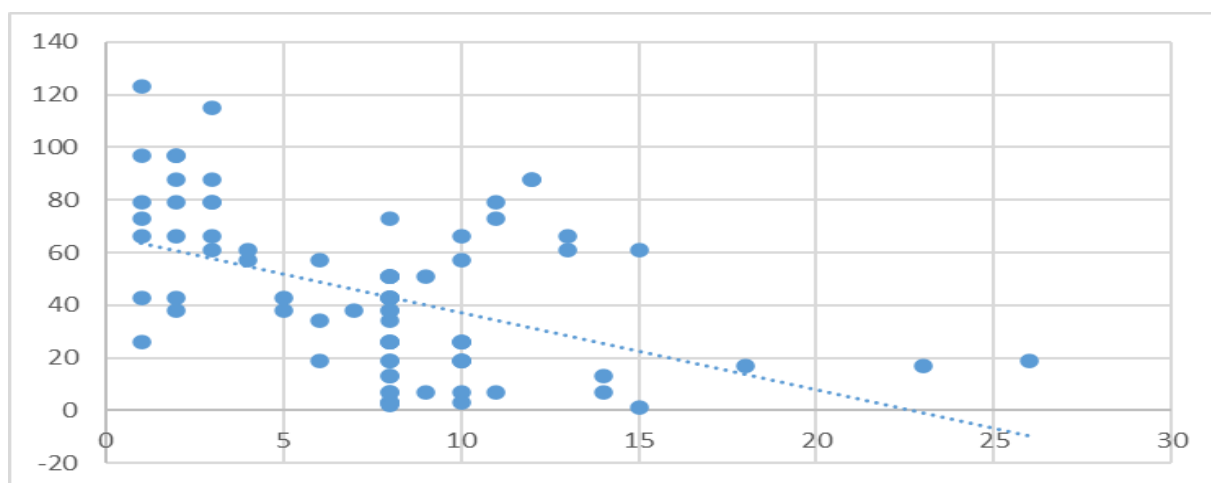


Figure 1. Correlation between the number of MRA agreements and the LPI grouped rank (2023)

As shown in Figure 1 above, in the 2023 cross-section an inverse (downward) trend is observed between the number of MRA agreements and the LPI grouped rank. This can be explained by the fact that for LPI rank indicators, smaller values indicate better performance. Therefore, as the number of MRAs increases, a country's position in the LPI ranking tends to improve. According to the Pearson correlation results, $r = -0.467$ ($n = 81$), indicating a moderate and statistically significant relationship.

The coefficient of determination for the trendline is also $R^2 \approx 0,218$, indicating that the number of MRAs explains a certain share of the variation in the LPI grouped rank. Similar results were observed for the LPI sub-components: the correlation with the Customs grouped rank is $r = -0,427$, with Logistics competence and quality $r = -0,464$, and with Timeliness $r = -0,442$ (all $n = 81$; $p < 0,001$). These findings empirically support the hypothesis that an increase in the number of MRA agreements is associated with improvements in LPI performance, particularly in customs efficiency indicators.

LPI performance is influenced by a range of factors beyond the number of MRAs. In particular, the development of transport and logistics infrastructure [5], the level of digitalization, the volume and composition of foreign trade, the institutional environment, customs risk management systems, and the quality of the logistics services market play an important role in explaining countries' LPI outcomes. Within the scope of this study, however, the ability to compile a complete and fully comparable dataset for these factors was limited; therefore, they were not included in the model as separate control variables.

Strengthening cooperation within AEO programmes is an important factor for promoting trade and ensuring supply chain security in Central Asia. Although AEO systems have been introduced in some countries of the region, differences in the legal framework, compliance requirements, the range of benefits granted, and practical implementation mechanisms still create a number of challenges for entrepreneurs engaged in cross-border trade.

Based on the findings, it was concluded that the WCO AEO Utility Block (UB) mechanism can be used more actively to support the effective operationalization and expansion of MRA agreements. The Utility Block (UB) provides a common basis for exchanging AEO-related information between customs administrations in a standardized format. In particular, it enables the timely and reliable transmission of data on an operator's authorization (status), the scope of the certificate, as well as information on the suspension or revocation of that status.[7]

Using the UB increases transparency, interoperability, and the level of trust between partner customs administrations, reduces the need to develop separate 'custom' technical solutions for each bilateral arrangement, and helps implement the MRA not merely as a political agreement but as a genuinely operational mechanism in practice. As a result, opportunities to deliver facilitation measures and benefits for businesses holding AEO status under the MRA framework are expanded.

4. Conclusion

Based on the analysis, the substance, practical significance, and implementation value of MRAs under the AEO programme were examined in a systematic manner. The MRA mechanism enables AEOs to benefit from simplified customs procedures in partner countries, thereby reducing clearance time, lowering transaction costs, and optimizing repetitive inspections and bureaucratic barriers. Within the scope of the study, it is substantiated that expanding the MRA network is a crucial factor for achieving policy objectives related to improving a country's performance in the Logistics Performance Index - particularly in the "customs efficiency" dimension - and for increasing the number of AEOs. The results of the correlation analysis indicate an association between a higher number of MRAs and improved LPI outcomes, confirming that the MRA track contributes to enhancing the efficiency of logistics and customs processes.

Moreover, as the number of MRA agreements increases, the practical value of AEO status rises: facilitation benefits are recognized not only domestically but also across partner jurisdictions. This strengthens the predictability, stability, and speed of customs clearance in foreign trade operations and makes obtaining AEO status more attractive for businesses.

As a practical recommendation, it is advisable to use the AEO–MRA Utility Block (UB) documents developed by the WCO during MRA negotiations and implementation. This approach helps standardize technical requirements and information exchange elements, thereby reducing the time and organizational costs associated with preparing the agreement and putting it into operation.

REFERENCES

1. Pham, T. (2021). Development Model for Facilitating the Negotiation of AEO MRAs. *World Customs Journal*, 15(2), 31–46.
2. Nkhahle, O., & Baldavoo, K. (2025). Evaluating AEO in facilitating trade and improving compliance. *International Journal of Research in Business and Social Science*, 14(9), 201–210.

3. Firdaus, H. A. (n.d.). Implementasi mutual recognition arrangement on authorized economic operator (MRA AEO) Indonesia-UAE terhadap pertumbuhan ekonomi Indonesia. Program Studi Hukum, Fakultas Hukum, Universitas Muhammadiyah Yogyakarta.
4. Kim, C.-B., Chung, I.-S., & Joo, H.-Y. (2019). Effects of AEO-MRA on the performance of exporters and importers in Korea. *Journal of Korea Trade*, 23(3), 78–93.
5. Xo‘jayev F.E.(2024) MDH mintaqasida transport sohasidagi hamkorlikni rivojlantirishda EOII transport integratsiyasining tashqi omillari va xavflari. *Yashil iqtisodiyot va taraqqiyot*, 11(11), 1099-1102.
6. World Bank. (2023). Connecting to compete 2023: Trade logistics in the global economy. World Bank Group. ipi.worldbank.org
7. Proposed by EU and US “Globally networked customs Utility Block AEO mutual recognition” 2013

INTERNETDAGI FOYDALANUVCHI SHARHLARIDA INFORMATIVLIK VA UNING LINGVOPRAGMATIK TAHLILI

Annotatsiya: Ushbu maqolada internet sharhlarining informativlik xususiyati va uning lingvopragmatik tahliliga oid ayrim mulohazalar bayon etilgan. Mazkur maqola internetdagi foydalanuvchi sharhlarining informativlik xususiyatlarini lingvopragmatik nuqtayi nazardan tahlil qilishga bag'ishlangan. Tadqiqotda internet kommentariylari alohida diskurs turi sifatida qaralib, ulardagi nutqiy aktlar, xususan, assertiv aktlarning informativ vazifalari J. Ostin va J. Searle nazariyalari asosida o'rganiladi. Sharhlarda lokutiv, illokutiv va perlokutiv jihatlarining o'zaro bog'liqligi, shuningdek, kommunikativ maqsad va intension masalalari yoritiladi. Tahlil natijalari internet sharhlarida informativlik faqat ma'lumot yetkazish bilan cheklanmay, muallifning yashirin yoki ochiq pragmatik niyatlarini ham ifodalashini ko'rsatadi.

Kalit so'zlar: nutqiy akt tushunchasi, assertiv nutqiy aktlar, perlokutiv va lokutiv jihatlar, kommunikativ maqsad, intensivlik.

INFORMATIVENESS IN USER COMMENTS ON THE INTERNET AND ITS LINGUVOPRAGMATIC ANALYSIS

Abstract: This article presents some considerations on the informative nature of Internet comments and their linguovopragmatic analysis. This article is devoted to the analysis of the informative nature of user comments on the Internet from a linguovopragmatic point of view. The study considers Internet comments as a separate type of discourse, and the speech acts in them, in particular, the informative functions of assertive acts, are studied based on the theories of J. Austin and J. Searle. The interrelation of locative, illocutionary and perlocutionary aspects in comments, as well as issues of communicative purpose and intention, are highlighted. The results of the analysis show that informativeness in Internet comments is not limited to conveying information, but also expresses the author's hidden or explicit pragmatic intentions.

Keywords: the concept of speech act, assertive speech acts, perlocutionary and locutionary aspects, communicative purpose, intensity.

Tobora yuksalib borayotgan bugungi globallashuv asrida ilmiy tadqiqotlarning barcha sohalarida keng ko'lamli izlanishlar olib borilmoqda. Shu jumladan, zamonaviy tilshunoslik olamida ham internetdagi foydalanuvchi

sharhlarini o'rganish dolzarb masalalardan biriga aylanmoqda. Chunki raqamli muloqot platformalari keng ommalashib borayotgan "axborot asri" da sharhlar, xususan, internet komentariylari, nafaqat, subyektiv fikr bildirish, balki kommunikativ munosabatlarni keng doirada shakllantirishning muhim vositasiga aylangan. Sharhlarning lingvistik nuqtayi nazaridan tahlili ularning nutqiy janr sifatidagi xususiyatlari, informativlik darajasi, pragmatik vazifalari va kontekstga bog'liqligini ochib beradi. Bu jarayonni atroflicha tushunishda nutqiy aktlar nazariyasi asosiy poydevor bo'lib xizmat qiladi.

XX asrning 2-yarmida J. Ostin va J. Searle tomonidan ishlab chiqilgan ushbu ta'limotga ko'ra, har bir nutqiy ifoda ma'lum bir illokutsion maqsadni bajaradi. J. Searle nutqiy akt (deklarativ, direktiv, ekspressiv, komissiv, assertiv) ni kommunikatsiya tizimining asosiy birligi sifatida baholab, uning funksiyaviyligiga urg'u beradi va quyidagicha fikrni ilgari suradi: "Lisoniy muloqot birligi, odatda, taxmin qilganlaridek simvol (ramz) so'z yoki gap emas, xatto simvol so'z yoki gapning belgisi ham emas, balki simvol so'z yoki gapning nutqiy akt ijrosi jarayonida yaratilishi va qo'llanilishidir". Austin esa bu masalaga strukturaviy jihatdan yondashib, lokutiv, illokuutiv va perlokutiv kabi turlar ko'rinishida tasnif qilgan. Bu tasniflar nazariy jihatdan yetarlicha o'rganilgan, ammo nazariyani matn tahliliga bog'lab amaliy jihatidan o'rganilishi bugungi kunning dolzarb vazifalaridan biri bo'lib qolmoqda.

Maqola internet komentariylarini internet diskursining alohida turi sifatida talqin etib, undagi nutqiy aktlarning informativlik xususiyatlarini Austin va Searle tasniflari asosida lingvopragmatik nuqtayi nazardan o'rganadi. Internet sharhlari esa ko'pincha **assertiv nutqiy aktlar** sifatida namoyon bo'lib, foydalanuvchi tomonidan ma'lumot berish, tajriba ulashish yoki baho bildirish kabi vazifalarni bajaradi. Shu bois, informativlikni lingvopragmatik jihatdan tahlil qilish nutqiy akt nazariyasining amaliy qo'llanilishiga yaqqol misol bo'la oladi. Mazkur maqola aynan shu bo'shliqni to'ldirishga qaratilib, kommentariylarning informativlik darajasini tahlil qiladi.

Ma'lumki Searle o'z tadqiqoti davomida illokutiv aktlarning turlarini ko'rsatib o'tadi. Shulardan biri assertiv akt sanaladi. Assertiv aktlar voqelik haqida g'oya yoki fikr-mulohaza bildirish, xabar berish, tavsiflash, taklif kiritish, inkor qilish yoki tasdiqlash kabi ma'nolarni o'z ichiga olishi bilan ahamiyatlidir. Qisqa qilib aytganda assertiv aktlar boshqa nutqiy akt turlaridan farqli ravishda ma'lumotlarni anliz qilish orqali ularning to'g'ri yoki noto'g'ri (ishonchsiz) ekanini tekshiradi. Masalan:

@borivoytorayev8121: Ichimizdagi og'riqli muammoni aytibsiz siz kabi insonlar ko'paysin.

Mazkur jumladagi informativlik pragmatik jihatidan uch bosqichda tahlil qilinadi. Ya'ni nutqiy aktlarning lokutiv, illokutiv va perlokutiv jihatlari ko'zga tashlanadi:

Lokutiv jihat: Ichimizdagi og'riqli muammoni aytibsiz. Ushbu gapda informativlik oddiy uslubda berilmoqda, ya'ni faktni bildiruvchi xabar orqali adresantga shunchaki ma'lumot yetkazilmoqda. Shu bilan bir qatorda pragmatik

mazmun doirasida **illokutiv jihatlar** (adresatning maqsadi: buyruq, iltimos, duo kabilar) ham ishtirok etgan: “*Siz kabi insonlar ko‘paysin*” qismi esa ta’kidlaganimizdek **duo/istak** illokutiv aktiga kiradi. So‘zlovchi o‘zining sharhi orqali post muallifiga nisbatan yaxshi tilak bildirishni maqsad qilgan. Bu xabarni o‘qish davomida adresantda kayfiyatida paydo bo‘lgan ko‘tarinkilik, ruhiy ta’sir va rag‘bat hislari nafaqat informativlikning ikki turi, balki perlokutiv jihatlar ham e’tibordan chetda qolmaganligini anglatadi.

@sherhon09: Hech qachon ozingizni qorqitmag ALLOH beradi Dangasalik panoh berguvchi Alloh bor mativatirlarga ketgan vohtizga harakat qlsez shu maqul.(Maslahat)

@ManzuraBurieva-x8k: Инсульт!Еки тромб кучган юрак кон томирдан. Хозир бу холат куп, ешга карамийди! Оллох рахмат килсин!. (Ogohlantirish)

@Ali-c9t9: Икки. Уч соатли кинони 7:32 дакикага сигдирган хаммани уйлашга чорлайдиган булибди хамма ишни уз устаси бажарганда юрагинггача етиб боради. Ко‘р hollarda internet sharhlari internet sharhlari nutqiy aktlarning assertiv guruhiga mansub bo‘lib, ijtimoiy tarmoq foydalanuvchilari orasida xabar almashinishning turli ko‘rinishlarida namoyon bo‘ladi. Lingvopragmatik tahlilda esa informativlikning nutqiy vaziyatga qay darajada bog‘liqligini tushuntirib beradi, ya’ni foydalanuvchi qanday auditoriyaga, qaysi platformada va qaysi til birliklaridan foydalangan holda yozayotganini aniqlashga yordam beradi.

Informativ nutqning maqsadini batafsilroq yoritish uchun intensional tahlil yondashuvi muhim ahamiyatga ega. Filologiya fanlari doktori, professori Sh.Safarovning mulohaza yuritishicha, “muloqot jarayonida ishtirokchilar o‘zaro munosabatlar tengligini ta’minlash uchun kommunikativ maqsadga mos keladigan harakatlar rejasini tuzadilar va ushbu rejani amalga oshirish imkonini beradigan lisoniy vositalarni tanlaydilar. Kommunikativ maqsad ifodasi ikki yo‘sinda kechishi ma’lum. Bularning biri intensiyaning yashirin ifodasi bo‘lsa, ikkinchisi fikrni ochiq izhor qilishdir” (Sh.Safarov, 318-bet). Tadqiqot natijalariga asosan, har bir nutqiy harakatda kamida ikki bosqichli maqsad: *boshlang‘ich intension* (gapning yuzaki maqsadi) va *natijaviy intension* (so‘zlovchining asl niyati) mavjudligi xulosa qilingan. Masalan, “Mehmonxonaga qanday borsam bo‘ladi?” degan jumla informativ so‘roq bo‘lsa-da (ya’ni muayyan javob talab qiluvchi so‘roq gap), asl maqsad — vokzalga yetib borishdir.

Bu masalada yetarlicha izlanishlarva muhim natijalar bo‘lishiga qaramay, intensional tahlilning internet sharhlarida qo‘llanishi bilan bog‘liq ayrim jihatlar hali to‘liq o‘rganilmagan va ochiq masala sifatida qolmoqda.

Internet komentariylarida kommunikativ maqsad ko‘pincha aynan shu ikki qatlamli model orqali namoyon bo‘ladi. Xalqona ibora bilan aytganda “kosa tagida nimkosa” bo‘lganidek, foydalalanuvchi biror voqea-hodisa haqida ma’lumot beradi (Ofarin. Baribir professional ish boshqa Juda foydali. Alloh rozi bo‘lsin. O‘zimni tahlil qilishga sabab bo‘ldi), aslida u orqali boshqa maqsad — e’tibor qaratish, suhbatni davom ettirish yoki shaxsiy kuzatishlarini boshqa foydalanuvchilarga ulashish kabi intensional maqsadni ham amalga oshiradi.

Xulosa qilib aytganda, internet komentariylari, nafaqat foydalanuvchi tajribasini ifodalash va ma'lumot yetkazishga qaratiladi, balki informativ mazmun ostida so'zlovchining intensioniga bog'liq maqsadlarni ham o'zida namoyon eta oladi. Ya'ni, informativ nutq maqsadi faqat "nima deyilyapti" degan savolga emas, balki "kim aytyapti, qanday vaziyatda, qachon, qanday niyat bilan" degan savollarga ham javob beradi. Tilshunos Kazberg ta'kidlaganidek, maqsadga erishish uchun lisoniy vositalardan foydalanish — bu faqat pragmatikaning emas, balki semantikaning ham vazifasidir.

Foydalanilgan adabiyotlar ro'yxati:

1. Austin J. L. *How to Do Things with Words*. Cambridge, MA: Harvard University Press, 1975.
2. Searle J. R. *Speech Acts: An Essay in the Philosophy of Language*. Cambridge: Cambridge University Press, 1969.
3. Searle J.R. A classification of illocutionary acts //Language in society –1976. – Vol. 5 – №1. – P.1.
4. Сафаров Ш. Прагмалингвистика. Монография. – Тошкент, 2008.
5. https://youtube.com/watch?v=ZlZ-N1SX0EM&lc=Ugzbay0nZ2QfYN0mCKF4AaABAg&si=VsIrjr8T5Bzbu_I6. Murojaat sanasi: 25.11.25
6. https://youtube.com/watch?v=Fzu4vkgb5N0&lc=Ugwe5hD0sjKliizSMIx4AaABAg&si=kxsey8aNQYfbt5T_. Murojaat sanasi 25.11.25
7. https://youtube.com/watch?v=8yYlecVw9oo&lc=UgyeBo_UtNpUgkigXTB4AaABAg&si=3aZWVpK1HZt2dWaw. Murojaat sanasi: 25.11.25
8. <https://youtube.com/watch?v=ZlZ-N1SX0EM&lc=UgwaZjKHK2IgHwq40n94AaABAg&si=gFrMIOZTvBy4e5xz>. Murojaat sanasi: 25.11.25

THE MOTIF OF REMEMBRANCE IN LYRIC POETRY EXEMPLIFIED THROUGH THE LYRICS OF S. IBRAGIMOV AND A. AXMATOVA

Annotation: *The article comparatively examines and analyzes the motif of remembrance in the works of the Karakalpak poet S.Ibragimov and the representative of Russian poetry A.Axmatova.*

Keywords: *motif of remembrance, lyrical hero, objects of remembrance, artistic detail, artistic space.*

The motif of remembrance is one of the most frequently used motifs in lyrical works. It can revive the past in a person's consciousness and compel them to recall events. The most impactful of these events inspire the poet to write poetry. Recollection often occurs when a person is alone, and in this respect, it is closely related to solitude. In our article, we will discuss the motif of remembrance in the poems of the poets S.Ibragimov and A.Axmatova, its peculiarity in reflecting the psychology and experiences of the lyrical hero.

The motif of remembrance was frequently employed in Russian literature, particularly rich in unique and novel imagery in the poetry of the Silver Age representatives. Because their creative work coincided with the change of social systems and centuries, the majority of representatives of the Silver Age experienced several conflicting feelings, such as a comparative reflection of today's and yesterday's life and society, a nostalgic remembrance of the past, and dissatisfaction with the present. Anna Axmatova was the most skilled poet of her time in portraying the motif of remembrance. A series of poems by the poet, created on the theme of remembrance, touches every reader, especially those who have suffered from love. In poems such as "We met for the last time", "You thought - perhaps me too..." "Like a burning stone at the bottom of a well..." "Sometimes I think about you..." and "Like a yellowish flame, that August" the poet recalls past events, revisiting them one by one in her thoughts.

The poet's verses, crafted with exceptional poetic mastery, are particularly noteworthy for their ability to convey to the reader's consciousness not only the regrets and sorrows of the past with their negative energetic qualities, but also to express that both grief and separation possess their own inherent charm and beauty. We preferred to analyze the motif of remembrance in the lyrics of A.Axmatova and S.Ibragimov through their love poems, because, as mentioned above, only love poems can express the past with both joyful and sorrowful qualities. Several of S.Ibragimov's poems are built on the motif of remembrance, in which the lyrical hero sometimes recalls joyful, good events with joy and longing, and sometimes sorrowfully recalls difficult, painful events. For example, poems such as "Which cinema was it, I forgot", "These are the traits ingrained in us", "There comes a time

when a flower is plucked...”, “You reside in my memory’s notebook...” and others aim to reflect the most wonderful and sorrowful moments of love. Certainly, for the majority of people, their love story begins with loss and failure. This process, especially in creative individuals, gives rise to fluctuating thoughts and emotions, and in the surge of intense feelings, leads to the birth of a magnificent work. According to Axmatova, real drama is a person’s ability to remember the past. Only remembering helps to sense the difference between “what was and what became” - in other words, remembering intensifies twofold [1.22]. Anna Axmatova’s “Song of the last farewell” and Saginbay Ibragimov’s “You live in my memorybook” are poems born from the influence of the last meeting, the lyrical subject and object’s feelings gazing at each other in the final moments. For example:

Diydarlastıq biz sońǵı iret,
Talay diydarlasqan jaǵısta.
Nevada suw tastı kópirip,
Qorıqtı sháhár tasqın aǵıstan.

Sózler edi ol jaz tuwralı.
Jaraspas, der, qızǵa – shayırılıq.
Yadta patsha úyi – tulǵalı,
Hám Petropavlovskiy qorganı:

Soń biz alǵan demler ózgerdi,
Al, allanıń inamı – qızıq.
Maǵan essiz bir qosıq berdi,
Ózi – qısqa, mazmunı – sozıq [2.63].

S. Ibragimov:

Jáne kóz aldımda súwretler gezer,
“baxıtlıman men...” dep sıbırлаǵanıń...
Denem xalıqlaǵan demińdi sezer
seniń, Yurmaladan qaytqan joldaǵı.

Qıl kópir ústinde barar bir eles,
qıl kópir ústinde eki tán, bir jan...
Bul jolda aqıldıń húkimi júrmes,
bul joldan júrgenniń júrek-bawrı qan...

Aqılǵa jeńdirip sheship bilmedik
bul názik sawdanıń qıyın jumbaǵın –
kewlim elegizip joyta beredi
seni, Yurmaladan qaytqan joldaǵı [3.76].

The most powerful manifestation of the memory motif is conveyed through lyrical plots such as the final meeting and farewell. This encounter is memorable, firstly, for being the last, and secondly, because in most cases, words remain unspoken and feelings unexpressed, leaving things unanswered and uncertain. This

phenomenon is especially characteristic of love poems. In the first poem taken as an example, the lyrical hero recalls the person they last met, thereby reminiscing about the moments that remained as unfulfilled dreams in their heart. While Axmatova portrays the last meeting as a plot, depicting the event with objects and details, S.Ibragimov recalls his love through the journey he cherished in his imagination, the road returning from Yurmala. In both poems, the spaces and meeting places prompt the poet to remember that event. The lyrical characters' attempts to recall that day are not accidental, as the words that should have been spoken at that moment, at the meeting place, prompt the protagonist to return, fill the gaps in his heart, and thereby release the pain that remained within him. The foundation of the memory motif in the poems is the place, that is, the space that has become a permanent meeting point for these two individuals. In Axmatova's work, the Neva River and its banks, and in S.Ibragimov's work, the return journey from Yurmala, serve as artistic details in the recollection. These spaces are valuable not for their beauty or aesthetic impact, but for being places that evoke memories of a person cherished by the lyrical protagonist.

The past, for a person, is an object reflected in their consciousness through increasingly frightening images; attempting to forget it paradoxically leads to its intensification. Thus, the struggle with the past and memories of the past is a constant phenomenon in human consciousness. This manifests only in negative and unsuccessful memories. This process has a particularly profound impact on the poet and becomes the foundation of persistent conflict in their creative work. The denial of the past frightens the lyrical hero, regardless of what exactly is forgotten - suffering or indifference. In Axmatova's hierarchy of tragic affects, the anguish arising from forgetfulness occupies a special place; in her view, it is closely intertwined with the concepts of guilt and crime. In the process of compelling a person to acknowledge the forces of time and necessity, the individual becomes the subject of struggle against these forces [1.10].

The struggle with memory and the past, repeatedly recalling it, and attempts to relive those moments in consciousness have become the object of depiction in both A.Axmatova's and S.Ibragimov's love poems. A.Axmatova's poem beginning with "Like a white stone at the bottom of a well..." and S.Ibragimov's poem "You live in my memory book..." reflect the lyrical hero living with the spirit of the past:

Qudıq túbindegi janıq tas kibi,
Bir sırlı yad kewilimde orıalasqan.
Ol – shadlıq hám quwanış sıylar maǵan,
Qálemeymen, joq etiwge qıyalmaspan.

Muńdı oqıy alar kózlerimdegi
Bir pırsat telmirip qaraǵan adam.
Eski hásiretimdi tıńlap júregi
Eljirer hám oyǵa talar qaytadan.

Sanalı etip jarattı táńri,
Yad qalsın dep ázzi adamda.
Eń súykimli hásiretim bolıp,
Jasap kelmekteseń sanamda [4.98].

The lyrical hero in the poem recalls all sorrows in order to reminisce about his love. He doesn't want to erase his memory or forget it, but rather to live with it, to live with the brief yet meaningful and joyful memories of an unsuccessful love story. Although these recollections evoke melancholic feelings in him, and their impact is visible in his appearance, he still considers it happiness to live with the love of the past. We perceive these same feelings in the lyrical hero of S. Ibragimov's poem; his philosophy of remembrance is built on emotions arising from pain, intense longing, and loss:

Sen jasaysań meniń yad dápterimde –
sorawlı telmirgen kózleriń menen.
Sol juwapsız qalǵan sawal qıynaydı.

Sen jasaysań meniń yad dápterimde,
tamamlanbay qalǵan ertegim bolıp –
qalay bolar edi, ne bolar edi...
Sen jasaysań meniń yad dápterimde –
túnleri qus bolıp basqa dúnyada,
kúndiz bunda náylaj men júrgenimde [3.152].

When examining the lyrics of any poet, we find that memories of sorrowful days and failures are more prevalent than those of happy and joyful times. By recalling and sifting through the sieve of thought their past unfulfilled deeds, unaccomplished tasks, pain, and losses, a person firstly draws conclusions from them and seeks ways to avoid repeating them in the future. On the other hand, as a result of feeling guilty and sinful, they recreate those events in their imagination, and with the desire to return to those moments and rectify everything, they compel themselves to recall the past. This process is shaped in human consciousness by concepts such as regret, failure, loneliness, longing, and separation.

REFERENCES

1. Симченко О.В. «Память» как лейтмотив в творчестве А. Ахматовой (Многообразие идейно-художественных аспектов). диссертации. кандидатский. фил. наук. автореферат. – Москва, 1985.
2. Генжемуратов Б. Лирика. – Нөкис: Билим, 1992.
3. Ибрагимов С. Таңламалы қосықлар. – Нөкис: Билим, 2016.
4. Ахматова А. Я голос ваш... – Москва: Книжная палата, 1989.

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EFFECT OF THYROID AUTOIMMUNITY ON RENAL STRUCTURAL CHANGES: CT AND US IMAGING INSIGHTS

Resume. *Autoimmune thyroid diseases (AITD), including Hashimoto's thyroiditis and Graves' disease, exert a systemic influence on metabolism, the cardiovascular system, and microcirculation, which may contribute to the development of structural renal changes and accelerate the progression of chronic kidney disease (CKD). Early detection of these changes is crucial for predicting renal function and selecting optimal patient management strategies.*

This review examines non-invasive renal imaging data using ultrasound (US), including elastography, and multislice computed tomography (MSCT) in patients with AITD. Special attention is given to the assessment of structural features such as reduced kidney size, cortical thinning, increased parenchymal echogenicity, as well as alterations in tissue density and structure on CT.

Current evidence on the relationship between thyroid dysfunction, autoimmune processes, and the progression of renal fibrosis is summarized. It is shown that the combined use of US and CT allows early detection of structural renal changes, prediction of CKD progression risk, and monitoring of therapeutic effectiveness.

The findings of this review emphasize the need for integration of radiological and endocrinological data for early diagnosis and personalized management of patients with autoimmune thyroid diseases at risk of developing renal fibrosis.

Keywords: *autoimmune thyroid diseases; renal fibrosis; chronic kidney disease; ultrasound; elastography; multislice computed tomography; structural renal changes; non-invasive diagnostics; endocrinology and nephrology.*

Introduction. Autoimmune thyroid diseases (AITD), including Hashimoto's thyroiditis and Graves' disease, are among the most prevalent endocrine disorders worldwide. Beyond their direct effects on thyroid function, AITD can influence systemic metabolism, cardiovascular health, and microcirculation, which in turn may affect renal structure and function. Chronic kidney disease (CKD) remains a global health challenge, with renal fibrosis being a key pathological process driving disease progression and loss of kidney function.

Recent evidence suggests that thyroid dysfunction, particularly in the context of autoimmunity, may accelerate structural renal changes and exacerbate CKD progression. Understanding these interactions is critical for early diagnosis, risk

stratification, and personalized management of patients with concomitant thyroid and renal disorders.

Non-invasive imaging modalities, such as ultrasound (US) with elastography and multislice computed tomography (MSCT), provide valuable insights into renal structural changes. These technologies allow assessment of kidney size, cortical thickness, parenchymal echogenicity, tissue stiffness, and CT-derived density alterations, offering a comprehensive evaluation of renal involvement in patients with AITD.

This review aims to summarize current knowledge regarding the impact of autoimmune thyroid disorders on kidney structure, focusing on radiological assessment using US and MSCT, and highlighting potential clinical and prognostic implications.

The interplay between thyroid dysfunction and renal pathology is multifactorial. Thyroid hormones influence renal blood flow, glomerular filtration rate (GFR), tubular function, and sodium-water homeostasis. Autoimmune mechanisms, including circulating antibodies and systemic inflammation, can further impair renal microvasculature and promote fibrotic remodeling.

In AITD, chronic low-grade inflammation and altered cytokine profiles may exacerbate interstitial fibrosis, leading to decreased kidney size, cortical thinning, and increased tissue stiffness. Patients with subclinical or overt hypothyroidism are particularly susceptible to these structural alterations, which may remain undetected without imaging.

Ultrasound remains the first-line imaging modality for evaluating renal structure due to its accessibility, safety, and cost-effectiveness. In patients with AITD, US parameters such as:

- Kidney size and volume – often reduced in advanced fibrosis
- Cortical thickness – thinner cortex correlates with nephron loss
- Parenchymal echogenicity – increased echogenicity indicates fibrosis or interstitial edema
- can provide early evidence of structural changes.

Doppler ultrasound offers additional information on renal perfusion and vascular resistance, measured through the resistive index (RI). Elevated RI values in patients with thyroid autoimmunity may reflect impaired microcirculation and early fibrotic remodeling.

Ultrasound elastography, including shear wave elastography, allows quantification of tissue stiffness. Increased stiffness correlates with histopathologically confirmed fibrosis, enabling non-invasive monitoring of disease progression in patients with AITD.

Multislice Computed Tomography (MSCT) Assessment MSCT provides high-resolution anatomical visualization of renal parenchyma and can detect subtle structural changes not always visible on ultrasound. Key CT markers relevant to fibrosis and thyroid-related renal involvement include:

- Reduction in renal volume and cortical thickness

- Heterogeneous parenchymal density
- Structural irregularities indicative of interstitial fibrosis

MSCT is particularly useful when US findings are inconclusive or when patients present with obesity or anatomical limitations. However, considerations regarding radiation exposure and contrast nephrotoxicity necessitate careful patient selection.

Combining US and MSCT findings with clinical and laboratory parameters enhances diagnostic accuracy and risk stratification. Correlating imaging markers with thyroid function tests, autoantibody profiles, and kidney function (e.g., serum creatinine, eGFR, proteinuria) allows for a more comprehensive assessment of renal risk in patients with AITD.

Recent studies demonstrate that patients with Hashimoto's thyroiditis or Graves' disease often exhibit measurable changes in renal structure, even in early CKD stages. Integrating imaging into routine monitoring may facilitate early interventions, such as optimizing thyroid function, managing blood pressure, and implementing nephroprotective therapies, thereby slowing progression of renal fibrosis.

The recognition of renal involvement in AITD has several practical implications:

1. Early Detection – Non-invasive imaging can identify structural renal changes before significant functional decline occurs.
2. Risk Stratification – Imaging markers, combined with thyroid function and autoantibody status, may predict patients at higher risk for CKD progression.
3. Therapeutic Monitoring – Elastography and serial US can track response to interventions, including thyroid hormone replacement and nephroprotective therapies.

Personalized Medicine – Integrating radiology and endocrinology supports individualized management, reducing complications and improving long-term outcomes.

Emerging techniques, such as radiomics, artificial intelligence (AI), and machine learning-based analysis of US and MSCT images, hold promise for enhancing detection of subtle renal changes in AITD. Quantitative imaging biomarkers may allow prediction of fibrosis severity, progression risk, and therapeutic response with higher accuracy than conventional imaging alone.

Multicenter longitudinal studies are needed to validate these biomarkers and establish standardized protocols. Integration of imaging, clinical, and molecular data could lead to predictive models for CKD progression in patients with autoimmune thyroid disorders, advancing personalized medicine in this field.

Recent research highlights the complex interplay between endocrine and renal systems, emphasizing that autoimmune thyroid diseases (AITD) not only affect hormonal balance but also significantly impact kidney microstructure. Chronic systemic inflammation, autoantibody-mediated tissue injury, and oxidative stress associated with AITD contribute to endothelial dysfunction and microvascular damage within the kidneys. These processes accelerate interstitial

fibrosis, glomerulosclerosis, and tubular atrophy, which can be detected through advanced imaging modalities before irreversible functional decline occurs.

Emerging studies suggest that even subclinical thyroid dysfunction can influence renal hemodynamics and parenchymal structure. For instance, patients with subclinical hypothyroidism exhibit subtle cortical thinning and increased renal stiffness on ultrasound elastography, indicating early fibrotic remodeling. These findings reinforce the importance of including thyroid function assessment in routine nephrological evaluations, particularly in patients with CKD risk factors.

The combination of ultrasound and MSCT provides complementary information. Ultrasound excels in evaluating parenchymal echotexture, cortical thickness, and tissue stiffness non-invasively, while MSCT allows high-resolution anatomical assessment and quantification of structural heterogeneity, including density variations and early fibrotic lesions. Incorporating Doppler-derived vascular parameters and elastography measurements enhances predictive accuracy for CKD progression, offering a non-invasive surrogate for histopathological evaluation.

Radiomics and artificial intelligence (AI) approaches are increasingly applied to integrate multiple imaging features into predictive models. Quantitative texture analysis of US and CT images can identify subtle patterns associated with renal fibrosis that are imperceptible to the human eye. Machine learning algorithms, trained on multimodal imaging datasets combined with laboratory and clinical data, have the potential to stratify patients according to progression risk, monitor response to therapy, and optimize personalized treatment strategies.

Furthermore, there is growing evidence that correcting thyroid dysfunction may positively influence renal outcomes. Early initiation of thyroid hormone replacement in hypothyroid patients has been associated with improved glomerular filtration rates and reduced proteinuria, suggesting a modifiable pathway that could mitigate fibrosis progression. Consequently, a multidisciplinary approach integrating endocrinology, nephrology, and radiology is essential to maximize patient outcomes.

Conclusion. Autoimmune thyroid diseases exert a significant impact on renal structure, promoting interstitial fibrosis, cortical thinning, and parenchymal changes that accelerate chronic kidney disease progression. Non-invasive imaging modalities, particularly ultrasound with elastography and multislice CT, provide critical insights into these structural alterations, enabling early detection, risk stratification, and therapeutic monitoring.

Integration of imaging findings with thyroid function assessment, autoantibody profiling, and renal biomarkers enhances predictive accuracy and supports a personalized, multidisciplinary approach to patient management. Emerging technologies, including radiomics and AI-driven analysis, offer promising avenues for earlier detection and individualized risk prediction, ultimately improving clinical outcomes.

Future research should focus on multicenter, longitudinal studies to validate imaging biomarkers, establish standardized protocols, and explore the effects of thyroid-targeted interventions on renal structure and function. Such efforts will

advance personalized medicine for patients with concurrent autoimmune thyroid disorders and chronic kidney disease, ensuring timely interventions and improved long-term renal health.

REFERENCES:

1. Jiang K, et al. Noninvasive assessment of renal fibrosis by magnetic resonance imaging and ultrasound techniques. *Translational Research*. 2019; doi: 10.1016/j.trsl.2019.05.004 — обзор неинвазивной диагностики почечного фиброза с использованием МРТ и УЗИ, описывающий современные визуализирующие методы.
2. Interrelationship between thyroid hormones and reduced renal function: a review article. *Thyroid Research*. 2024; 17:14 — обзор взаимодействия гормонов щитовидной железы и функции почек, включая влияние на СКД.
3. The Interaction Between Thyroid and Kidney Disease. *PMC / NIH Review*. — обсуждение взаимосвязи между дисфункцией щитовидной железы и хронической болезнью почек, включая влияние на структуру почек.
4. Wan S, et al. Noninvasive diagnosis of interstitial fibrosis in chronic kidney disease: diagnostic accuracy and methods. *International Urology and Nephrology*. 2024 — современные методы неинвазивной диагностики интерстициального фиброза при ХБП.
5. Tang Y, et al. Noninvasive assessment techniques for renal fibrosis. *PMC* 2025 — обзор современных подходов к диагностике почечного фиброза с обсуждением роли визуализации и ИИ методов.
6. Yuan G, et al. Noninvasive assessment of renal function and fibrosis in CKD patients using histogram analysis based on diffusion kurtosis imaging. *Japanese Journal of Radiology*. 2023; 41:180–193 — статья о применении DKI МРТ и анализе гистограмм для оценки фиброза при ХБП.
7. Bhuwania P, et al. Relationships of Chronic Kidney Disease and Thyroid Dysfunction in Patients with Stage 4 and 5 CKD: A Cross Sectional Study. *EMJ Reviews*. 2023 — исследование взаимосвязи между дисфункцией щитовидной железы и прогрессированием СКД.
8. Assessment of Thyroid Function in Chronic Kidney Disease Patients: clinical and biochemical analysis. *Cureus*. 2024 — клиническое исследование частоты и характера дисфункции щитовидной железы у пациентов с СКД

THE DEVELOPMENT OF TOURISM IN THE MODERN ERA

Abstract: *this article examines the development of tourism in the modern era, focusing on its economic, social, and technological aspects. The study highlights the role of tourism as one of the fastest-growing sectors of the global economy and emphasizes its contribution to employment, income generation, and cultural exchange. Special attention is given to the impact of digital technologies, globalization, and sustainable development on the transformation of the tourism industry. In addition, the article analyzes current trends in tourism development, including digital tourism services, eco-tourism, and smart tourism solutions. The findings demonstrate that the effective development of tourism requires innovative approaches, strategic planning, and the integration of modern technologies to ensure long-term sustainability and competitiveness.*

Keywords: *tourism development, modern tourism, digital tourism, sustainable tourism, tourism industry, innovation, globalization, smart tourism.*

In the modern era, tourism has become one of the key sectors contributing to economic development and social progress. In Uzbekistan, tourism is regarded as a strategically important sector that plays a significant role in diversifying the national economy, increasing employment, and promoting the country's rich cultural and historical heritage at the international level. In recent years, large-scale reforms have been implemented to develop tourism infrastructure, simplify visa procedures, and improve the quality of services in the tourism industry [1].

The adoption of state programs and long-term development strategies has significantly accelerated the growth of tourism in Uzbekistan. In particular, the establishment of the State Committee for Tourism Development and the implementation of the "Tourism Development Concept until 2030" have created favorable conditions for the expansion of both domestic and international tourism. As a result, the number of foreign visitors has increased substantially, and new tourist destinations have been developed across various regions of the country [2].

Moreover, digital transformation has become a key factor in the modern development of tourism in Uzbekistan. The introduction of online booking systems, electronic visas, digital tourism platforms, and smart tourism technologies has improved the accessibility and efficiency of tourism services. Alongside economic benefits, special attention is also given to sustainable tourism development, the preservation of cultural heritage, and environmental protection, which are considered priority directions of national tourism policy [3].

Thus, the development of tourism in modern Uzbekistan is closely linked to economic reforms, digitalization, and sustainable development goals, making tourism one of the most promising sectors of the national economy.

The effective development of tourism is closely connected with the availability of modern infrastructure. In Uzbekistan, significant efforts have been made to expand hotel networks, improve transport and logistics services, and enhance the quality of tourism services in accordance with international standards. As a result, the material and technical base of the tourism industry has been considerably strengthened [4].

At the same time, the introduction of digital technologies has played an important role in improving tourism services. The implementation of electronic visa systems, online booking platforms, mobile applications, and digital information resources has made tourism services more accessible and convenient for travelers. These innovations have significantly contributed to increasing the competitiveness of the tourism sector [5].

Tourism development in Uzbekistan is increasingly based on the principles of sustainability, with special emphasis placed on environmental protection and the preservation of cultural heritage. The promotion of eco-tourism, pilgrimage tourism, and cultural tourism has contributed to the rational use of natural resources and the conservation of historical monuments [6].

Restoration works carried out in historic cities such as Samarkand, Bukhara, Khiva, and Shakhrisabz, along with measures aimed at protecting UNESCO World Heritage sites, have significantly enhanced the country's tourism potential and strengthened its international reputation [7].



Figure 1. The Modern Development of the Tourism Sector in Uzbekistan

Tourism plays an important role in the national economy by creating new jobs, increasing employment opportunities, and stimulating regional development. The sector also supports the growth of small businesses and entrepreneurship while attracting foreign investment [8].

According to experts, the continued development of tourism will contribute to the growth of gross domestic product and further strengthen Uzbekistan's position in the global economic arena in the coming years.

REFERENCES

1. Ministry of Tourism and Cultural Heritage of the Republic of Uzbekistan. *Tourism Development Strategy of Uzbekistan*. Tashkent, 2022.
2. State Committee of the Republic of Uzbekistan for Tourism Development. *Annual Report on Tourism Development*. Tashkent, 2023.
3. UNWTO. *Tourism Development and Sustainability in Central Asia*. Madrid, 2022.
4. Decrees of the President of the Republic of Uzbekistan on tourism development. — Tashkent, 2022.
5. State Statistics Committee of the Republic of Uzbekistan. *Tourism Statistics Report*. — 2023–2024.
6. Ministry of Tourism and Cultural Heritage of the Republic of Uzbekistan. *Report on Tourism Infrastructure Development*. — 2023.
7. UNWTO. *Digital Transformation in Tourism*. — Madrid, 2023.
8. UNWTO. *Sustainable Tourism Development*. — 2022.
9. UNESCO. *World Heritage and Tourism*. — 2023.
10. World Bank. *Tourism and Economic Growth*. — 2024.

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ASSESSMENT OF TRAINING NEEDS OF AUTO HOLDING PERSONNEL

Abstract: *The article examines approaches to assessing the training needs of personnel in a regional automotive holding company.*

Keywords: *auto holding, personnel, training needs.*

Training is considered a mandatory and important element of the personnel management system of an employing organization, determining the direction and content of professional development and career growth [1].

The technology of professional development of personnel in a regional holding company is implemented within a systemic approach to identifying training needs.

The assessment of training needs of auto holding personnel represents a systematic process of identifying and analyzing gaps between the actual level of employees' competencies and the requirements imposed by business objectives, manufacturers, and the market as a whole. This process is a key element of the personnel management system and ensures the purposeful development of the dealership's human resources potential.

The specificity of an auto holding's activities is determined by high technological complexity of processes, strict standards of automobile manufacturers, strong dependence of performance results on the quality of customer service, and intense market competition. Under these conditions, personnel training is not auxiliary but strategic in nature and directly affects financial and reputational indicators.

Training needs assessment is carried out by the HR department jointly with department managers and identifies gaps between existing employee competencies and the requirements of job profiles, manufacturers' technological standards, and corporate KPIs.

The process of training needs assessment in an auto holding is based on the following principles:

- orientation toward business goals and performance indicators;
- consideration of manufacturers' requirements and certification programs;
- complexity and multilevel assessment;
- regularity and cyclic nature of assessment;
- practical orientation of identified needs.

The integrated approach involves analysis at three levels:

- organizational level — identification of departmental needs and competency gaps affecting the performance of departments and the auto holding as a whole;
- group level — analysis of professional and behavioral competencies of teams working in service, sales, and administrative units (the results determine the need for team trainings, customer service standards training, and business process optimization);
- individual level — assessment of competencies of specific employees (individual training needs are formed considering the current position, talent pool preparation, and career growth prospects).

HR specialists together with managers develop a training needs assessment matrix (Table 1).

Table 1

Employee Training Needs Assessment Matrix (example)

Position	Required competencies	Current level	Competency gap	Required training
Service advisor	Customer communication, CRM operation, labor-hour standards knowledge	Average	Medium gap	Customer service and CRM training
Auto mechanic	Diagnostics, work with dealer equipment	Below average	High gap	Manufacturer training programs, advanced training
Sales manager	Sales techniques, product knowledge	Average	Minor gap	New model product training
Service center administrator	Customer service, documentation, reporting	High	No gap	Refresher training

The matrix is developed for each department and approved by the manager. On its basis, an annual training plan is formed.

The auto holding uses the following tools to assess training needs:

- KPI analysis (failure to meet labor-hour standards, number of documentation errors, customer complaints);
- certification and competency assessment using behavioral and professional indicators;
- employee surveys (self-assessment);
- manager assessment using 180° and 360° models;
- results of entry testing during adaptation;
- analysis of customer complaints and requests;
- manufacturers' requirements (certifications).

The HR department conducts training needs assessments to understand the impact of training activities on personnel development.

The auto holding applies a system of indicators and criteria to evaluate how training affects the dynamics of competency development, customer service quality, key production indicators, and economic performance.

The approach to training needs assessment is presented in Table 2.

Table 2
Indicators for Assessing Employee Training Needs (example)

Indicator	Information manifestation	Source	Standard (criterion)
Deviation from KPI baseline	Failure to meet labor-hour standards, documentation errors, overdue service orders	Managers' reports	Deviation not more than 10%
Number of operational errors	Technical errors, incorrect documentation, customer complaints	CRM, quality audits	No more than 2 errors per month
Certification results	Final competency scores	Competency assessment card	Score below 70% requires training
Customer Satisfaction Index (CSI)	Customer feedback after service	CRM → CSI module	CSI decrease > 5 points = training
Manufacturers' requirements	Mandatory programs, CHERY, JAC, Kia standards	Manufacturer materials	Failed certification = training

The table allows identification of competency gaps and determination of what training is required for an employee or department.

Analysis of the presented indicators shows that training needs assessment is comprehensive and practice-oriented. It includes both subjective indicators (training satisfaction) and objective metrics — KPI, error rate, CSI, and growth of production indicators.

Training needs assessment ensures effective solutions to a range of relevant tasks at different stages of the training process, such as rational formation of training groups, development of training programs, selection of methodological materials, and determination of control criteria and indicators.

It is taken into account that training needs must be periodically adjusted depending on environmental conditions, and accordingly, the preparation and implementation of the training process must also be revised.

Training needs assessment in an auto holding is closely related to the quality management system and customer service. A decrease in CSI, an increase in claims, and repeated customer visits are considered indicators of the need for additional training of service and sales personnel.

Training becomes an effective tool for increasing customer loyalty and strengthening the competitive position of the auto holding.

Regular training needs assessment ensures the relevance of educational programs, avoids excessive costs, and increases the return on investment in personnel development. The systemic nature of this process ensures personnel adaptation to changes in technologies, manufacturers' standards, and market requirements, which is a necessary condition for sustainable development of the auto holding.

The results of training needs assessment are used not only for planning training activities but also for adjusting personnel policy, forming the talent pool, and building individual professional development trajectories, ensuring the

integration of training, assessment, and career development within the human resource management system.

References

1. Odegov Yu.G., Nikonova T.V. *Training and Development of Organization Personnel: Textbook for Universities*. Moscow: Yurait, 2019, 303 p.
2. Polevoy M.V. (ed.). *Technologies of Training and Development of Personnel in an Organization*. Moscow, 2020/2022, 636 p.
3. Solomanidina T.O. *Human Resource Management in the Service Sector*. Moscow: Yurait, 2020, 287 p.
4. Travin V.V., Dyatlov V.A. *Human Resource Management: Personnel Assessment, Training and Development*. Moscow: Delo, 2018, 336 p.

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THE ROLE OF MARKETING MANAGEMENT IN STRENGTHENING PUBLIC HEALTH PROTECTION SYSTEMS

Abstract: *Marketing management plays an increasingly important role in strengthening public health protection systems by improving the effectiveness of health communication, resource allocation, and preventive strategies. This article explores how marketing management tools and approaches can be applied to public health to enhance population awareness, promote healthy behaviors, and increase access to preventive and medical services. Special attention is given to the use of social marketing, data-driven decision-making, and stakeholder engagement in addressing public health challenges. The study emphasizes that the integration of marketing management into public health systems contributes to reducing disease incidence, improving service quality, and enhancing the sustainability of health protection programs. Effective marketing management is identified as a key factor in achieving better public health outcomes and strengthening the overall resilience of health systems.*

Keywords: *Marketing management; public health protection; health systems; disease prevention; social marketing; health promotion; population health.*

I. Introduction

In the contemporary landscape of public health, the integration of marketing management has emerged as a pivotal factor in reinforcing protection systems. As health challenges proliferate due to population shifts and resource constraints, traditional approaches necessitate a paradigm shift toward innovative marketing strategies that can effectively communicate essential health information and foster community engagement. This is increasingly vital as consumer behavior evolves; for example, Generation Z exhibits unique preferences that influence their engagement with brands, underscoring the necessity for tailored messaging that resonates with their values, particularly around sustainability and trust (Theocharis D et al., 2025) . Additionally, as the proliferation of digital platforms reshapes information dissemination, the careful application of marketing principles enables public health initiatives to adapt and respond to consumer needs while maintaining ethical considerations amidst potential misinformation (Theodorakopoulos L et al., 2025) . Ultimately, a strategic marketing management framework can enhance public health outcomes by promoting awareness, facilitating access to resources, and encouraging proactive health behaviors within communities.

II. Overview of the intersection between marketing management and public health protection systems

The intersection of marketing management and public health protection systems represents a critical nexus for enhancing community well-being and outreach effectiveness. As public health initiatives increasingly rely on strategic communication to engage and educate populations, marketing principles become essential in disseminating health information and encouraging behavioral changes. For example, adopting innovative food systems can address food security challenges by promoting sustainable practices—marketing management plays a vital role in shaping consumer perceptions and acceptance of these initiatives (Habib M et al., 2025) . Furthermore, the rise of digital platforms has redefined strategies for viral marketing, enabling health messages to spread rapidly and efficiently, thus transforming consumer behavior in response to public health campaigns (Theodorakopoulos L et al., 2025) . Equally important is understanding Generation Zs consumer habits, which emphasize sustainability and ethical considerations; effectively targeting this demographic can significantly influence their health-related purchasing decisions (Theocharis D et al., 2025) . Lastly, pharmacovigilance exemplifies how marketing management can enhance public confidence in health interventions through transparent communication of vaccine safety (Mohd. Wasiullah et al., 2025) . Through these approaches, marketing management is integral to reinforcing public health protection systems and promoting healthier communities.

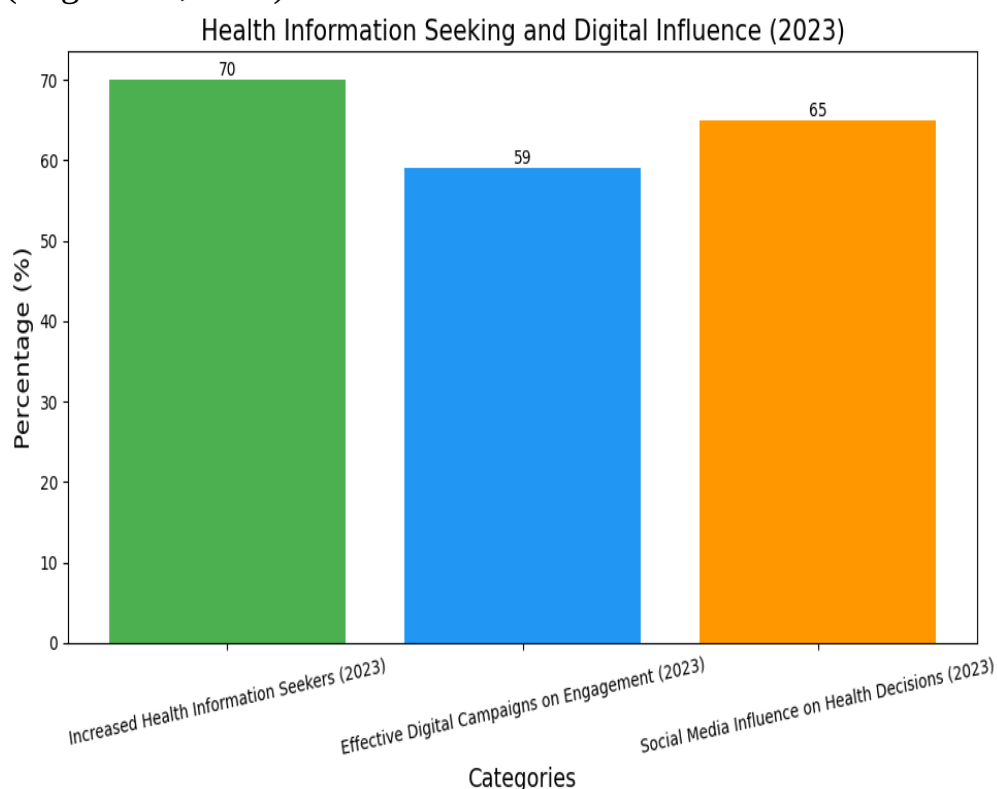
III. The Importance of Strategic Communication in Public Health

Effective strategic communication is paramount in public health, particularly as it intersects with marketing management to strengthen health protection systems. By employing clear, targeted messaging, health organizations can effectively influence public perception and behavior, a crucial factor in addressing health crises. For instance, studies reveal that digital platforms have fundamentally transformed the dissemination of health information, allowing for greater engagement and understanding among audiences, especially younger demographics like Generation Z who prioritize sustainability in their consumption choices (Theocharis D et al., 2025) . Moreover, integrating communication strategies that consider the dynamics of social networks can amplify health campaigns, enhancing their reach and impact (Theodorakopoulos L et al., 2025) . Similarly, addressing issues related to misinformation and ethical challenges further underscores the necessity of strategic communication (Shirkoohi SM et al., 2025) . Ultimately, the cultivation of trust through transparent dialogue and educational outreach can foster community resilience, reinforcing the overall efficacy of public health initiatives and marketing efforts (Olabanji MF et al., 2025) .

IV. How effective marketing strategies enhance public awareness and education on health issues

Marketing strategies play a crucial role in enhancing public awareness and education on health issues, effectively bridging the gap between scientific knowledge and community engagement. By synthesizing dynamic platforms and

tailored messaging, these strategies foster an environment where critical public health information becomes accessible and appealing to diverse audiences. For instance, the rise of digital marketing leverages social media influencers and targeted campaigns to resonate with specific demographic groups, particularly Generation Z, whose behaviors indicate strong inclinations towards sustainability and health consciousness (Theocharis D et al., 2025) . Additionally, interactive marketing techniques leverage real-time feedback and community engagement, which amplify message dissemination and drive participatory health education efforts (Theodorakopoulos L et al., 2025) . In a similar vein, innovative approaches in health-related advertising can promote engagement while fostering trust, essential for behavioral change (Habib M et al., 2025) . Overall, effective marketing strategies facilitate a multifaceted approach to public health education, ensuring that essential health information reaches and resonates with broader populations (Coghlan A, 2025) .



The chart illustrates three key areas of health information-related trends in 2023: the percentage of individuals seeking health information has risen to 70%, indicating strong engagement. Additionally, effective digital campaigns show a percentage of 59%, highlighting their role in audience interaction. Social media's influence on health decisions stands at 65%, demonstrating its significant impact on public health education.

V. Utilizing Data Analytics for Targeted Health Campaigns

Data analytics has emerged as a pivotal tool in crafting targeted health campaigns, enhancing the efficiency and effectiveness of public health communication strategies. By leveraging vast amounts of data, health organizations can identify at-risk populations and tailor messages that resonate with specific demographic groups, thereby streamlining resource allocation and maximizing

outreach impact. This approach aligns with the growing recognition that effective marketing management is crucial in public health protection systems, where traditional methods often fail to engage diverse communities. For instance, analyzing social media trends can reveal public attitudes towards health initiatives, allowing campaigns to adapt in real time to better meet community needs (Addula SR, 2025) . Furthermore, integrating data on health behaviors and outcomes with advanced analytics can provide powerful insights into the factors driving health disparities, facilitating more nuanced interventions (Romanishyn A et al., 2025) . Consequently, utilizing data analytics not only empowers health campaigns but also helps build a resilient public health framework that responds to the evolving needs of society (Habib M et al., 2025) .

VI. The role of data-driven marketing in identifying and addressing specific health needs within communities

In recent years, data-driven marketing has emerged as a pivotal tool for identifying and addressing specific health needs within communities, thereby significantly enhancing public health protection systems. By leveraging sophisticated analytics, organizations can uncover patterns and trends that reveal gaps in health services or emerging health crises, among them the effects of environmental factors on well-being as highlighted in (Habib M et al., 2025) . Furthermore, the integration of social network theory and behavioral dynamics into marketing strategies enables tailored messages that resonate with diverse populations, effectively promoting health initiatives and preventive measures, as discussed in (Theodorakopoulos L et al., 2025) . This personalized approach is particularly effective with Generation Z, who prioritize sustainable and meaningful consumption while making health-related decisions, underscoring the importance of building trust and brand loyalty in public health messaging (Theocharis D et al., 2025) . Additionally, advancements in environmental DNA (eDNA) research can complement marketing data by offering insights into community health needs, reinforcing the imperative role of comprehensive data management in policymaking (Altermatt F et al., 2025) .

VII. Conclusion

In conclusion, the pivotal role of marketing management in bolstering public health protection systems cannot be overstated. By leveraging innovative marketing techniques, such as AI-driven personalized communication and strategic branding, public health initiatives can engage communities more effectively, particularly among demographics like Generation Z, who prioritize sustainability and trust in brand interactions (Theocharis D et al., 2025) . Furthermore, the intersection of geopolitical factors and digitalization emphasizes the need for adaptive marketing strategies to navigate the complexities of contemporary healthcare environments (David J Teece, 2025) . Effective marketing management not only facilitates greater awareness of health initiatives but also fosters trust and loyalty among target populations, enhancing the overall effectiveness of public health campaigns. As the landscape of health communication evolves, embracing data-driven insights and maintaining ethical standards will be crucial in advancing health protection

strategies and ensuring accessibility to diverse populations (Vinay V et al., 2025). This multifaceted approach ultimately strengthens societal resilience against public health crises.

References

1. Mehvish Habib, Sakshi Singh, Shumaila Jan, Kulsum Jan, Khalid Bashir (2025). The future of the future foods: understandings from the past towards SDG-2. Volume(9), 138-138. npj Science of Food. <https://doi.org/10.1038/s41538-025-00484-x>
2. Leonidas Theodorakopoulos, Alexandra Theodoropoulou, Christos Klavdianos (2025). Interactive Viral Marketing Through Big Data Analytics, Influencer Networks, AI Integration, and Ethical Dimensions. Volume(20), 115-115. Journal of theoretical and applied electronic commerce research. <https://doi.org/10.3390/jtaer20020115>
3. Dimitrios Theocharis, Georgios Tsekouropoulos (2025). Sustainable Consumption and Branding for Gen Z: How Brand Dimensions Influence Consumer Behavior and Adoption of Newly Launched Technological Products. Volume(17), 4124-4124. Sustainability. <https://doi.org/10.3390/su17094124>
4. Florian Altermatt, Marjorie Couton, Luca Carraro, François Keck, Lori Lawson Handley, Florian Leese, Xiaowei Zhang, et al. (2025). Utilizing aquatic environmental DNA to address global biodiversity targets. Volume(1), 332-346. Nature Reviews Biodiversity. <https://doi.org/10.1038/s44358-025-00044-x>
5. Вікторія Шаповалова (2025). Telemedicine and Telepharmacy in Modern Healthcare: Innovations, Medical Technologies, Digital Transformation. Volume(5), 1-1. SSP Modern Pharmacy and Medicine. <https://doi.org/10.53933/r7f5xj91>
6. Alexandra Coghlan (2025). Towards an understanding of the volunteer tourism experience. ResearchOnline at James Cook University (James Cook University). <https://doi.org/10.25903/h6fy-5t43>
7. Santosh Reddy Addula (2025). Mobile Banking Adoption: A Multi-Factorial Study on Social Influence, Compatibility, Digital Self-Efficacy, and Perceived Cost Among Generation Z Consumers in the United States. Volume(20), 192-192. Journal of theoretical and applied electronic commerce research. <https://doi.org/10.3390/jtaer20030192>
8. Alexander Romanishyn, Olena Malyska, V. A. Goncharuk (2025). AI-driven disinformation: policy recommendations for democratic resilience. Volume(8), 1569115-1569115. Frontiers in Artificial Intelligence. <https://doi.org/10.3389/frai.2025.1569115>
9. Sina Mirzaye Shirkoohi, Muhammad Mohiuddin (2025). Digital Transformation in International Trade: Opportunities, Challenges, and Policy Implications. Volume(18), 421-421. Journal of risk and financial management. <https://doi.org/10.3390/jrfm18080421>
10. Mary Funke Olabanji, Munyaradzi Chitakira (2025). The Adoption and Scaling of Climate-Smart Agriculture Innovation by Smallholder Farmers in South Africa:

A Review of Institutional Mechanisms, Policy Frameworks and Market Dynamics. Volume(6), 51-51. World. <https://doi.org/10.3390/world6020051>

11. Mohd. Wasiullah, Piyush Yadav Piyush Yadav, Ghanshyam S. Yadav, Manish K. Vishwakarma, Rajesh Yadav (2025). Enhancing Vaccine Safety: The Role of Pharmacovigilance in Public Health. Volume(10), 2413-2417. International Journal of Pharmaceutical Research and Applications. <https://doi.org/10.35629/4494-100224132417>

12. David J. Teece (2025). The multinational enterprise, capabilities, and digitalization: governance and growth with world disorder. Volume(56), 7-22. Journal of International Business Studies. <https://doi.org/10.1057/s41267-024-00767-7>

13. Vineet Vinay, Praveen Jodalli, Mahesh Chavan, Chaitanya. S. Buddhikot, Alexander Maniangat Luke, Mohamed Ingafou, Rodolfo Reda, et al. (2025). Artificial Intelligence in Oral Cancer: A Comprehensive Scoping Review of Diagnostic and Prognostic Applications. Volume(15), 280-280. Diagnostics. <https://doi.org/10.3390/diagnostics15030280>

ON THE ISSUE OF ORGANISING INDEPENDENT LEARNING ACTIVITIES OF SCHOOLCHILDREN IN THE STUDY OF THE RUSSIAN LANGUAGE

Annotation: *The article examines contemporary approaches to organizing independent learning activities of schoolchildren in the process of teaching the Russian language. It is emphasized that the effectiveness of independent work largely depends on the level of students' learning motivation, as well as on the degree of development of their cognitive processes, such as attention, thinking, memory, and imagination. Particular attention is paid to the use of a system of exercises and text-based tasks that contribute to the development of skills of independent analysis and meaningful assimilation of educational material. The significance of creative forms of independent work aimed at developing the ability to express one's own position and to justify personal opinions is highlighted. The formation of independent learning skills is considered in close connection with the development of self-control and self-regulation abilities in the learning process.*

Keywords: *independent learning activity, skills and abilities, learning motivation, self-control, communicative and linguistic readiness, individual opinion.*

In the methodology of teaching Russian as a non-native language, the problem of forming students' independent learning activity occupies one of the key positions. Under conditions of educational modernization, there is an increasing need to develop schoolchildren's ability to acquire knowledge independently, to use linguistic resources consciously, and to participate actively in speech interaction.

Despite the widespread recognition of the importance of independent work in education, pedagogical science has not yet developed a single, universally accepted definition of this concept. Nevertheless, most researchers agree that independent learning activity represents a specific form of organizing instruction in which the learner acts as an active subject of the cognitive process.

From a psychological and pedagogical perspective, successful completion of independent tasks is possible provided that students demonstrate a stable interest in learning activities, a sufficient level of development of cognitive processes, and a certain amount of knowledge and skills. At the same time, genuine independence presupposes the learner's ability to plan and control their own activity rationally.

The rational organization of independent work includes several interrelated stages: understanding the purpose of the task, analyzing the conditions for its completion, selecting an optimal sequence of actions, monitoring the correctness of performance, and subsequently correcting any errors made. Teaching practice shows that a significant proportion of students experience difficulties in managing

their own learning activities, which indicates an insufficient level of independence formation.

Students' readiness for independent foreign-language speech activity is of a complex nature and includes motivational, intellectual, linguistic, and communicative components. The motivational component is determined by students' interest in the target language and their awareness of the practical significance of the tasks performed in solving real communicative problems. The intellectual component is associated with the level of development of basic psychological functions such as attention, memory, and thinking, which have age-related characteristics. The linguistic component presupposes that students possess an adequate stock of lexical and grammatical material that ensures the construction of correct and logically coherent utterances. Communicative readiness is manifested in students' ability to actively engage in the process of communication and to use language as a means of interaction.

The formation of independent learning activity is carried out in stages. At the initial stage, the leading role belongs to the teacher, who provides comprehensive support to students. As learners' independence develops, the extent of pedagogical guidance gradually decreases, and students begin to perform tasks without direct teacher intervention.

An effective means of developing independence is a system of exercises built on the principle of gradual complication and increasing degrees of learner autonomy. Depending on the nature of learning actions, various types of independent work can be distinguished.

The reproductive type of independent work is aimed at developing skills of analyzing and systematizing educational material. Within this type, tasks are used that involve identifying key information, determining the main ideas and arguments of a text, and selecting key words to support an utterance.

The reproductive–transformational type of independent work involves the active use of techniques of linguistic and semantic transformation. Such tasks include retelling a text from different perspectives, as well as producing shortened or expanded versions of a message.

The creative type of independent work is oriented towards developing students' ability for independent thinking and expressing a personal position. Students are encouraged to justify their own viewpoints, compare information from various sources, and participate in discussions of problem-based issues.

An integral component of independent learning activity is the formation of self-control skills. At the initial stage, control over task performance is carried out by the teacher, who accompanies error correction with appropriate explanations. At the next stage, students master individual self-control techniques and begin to correct their own activity independently with minimal teacher assistance. At a later stage, when self-control is insufficiently automatized, indirect signals from the teacher, such as intonation or facial expressions, may serve as cues for self-correction.

Independent work may be organized both in classroom and extracurricular forms. Classroom-based independent work is carried out with the direct participation of the teacher, who guides students' speech activity and controls both the process and the outcomes of task completion. Extracurricular independent work has a different orientation and is primarily aimed at developing reading and writing skills, thereby contributing to the deepening of students' linguistic competence.

The list of used literatures.

1. Zharova, L. V. *Managing Students' Independent Learning Activities*. Leningrad, 1992.
2. Pidkasisty, P. I. *Independent Cognitive Activity of Schoolchildren in the Learning Process*. Moscow, 1980.

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SCIENTIFIC AND THEORETICAL FOUNDATIONS AND METHODOLOGICAL ASPECTS OF THE COMPETENCY-BASED APPROACH IN HIGHER EDUCATION

Annotation: This article examines the contemporary scientific and theoretical foundations and methodological aspects of implementing a competency-based approach in the system of higher education. The necessity of modernizing the educational process under conditions of rapid scientific and technological development is substantiated, and the role of professional and personal competencies in training future specialists is highlighted. International and national regulatory documents are analyzed, including the Concept for the Development of Public Education in the Republic of Uzbekistan until 2030. The importance of integrating information and communication technologies and innovative teaching methods into the educational process is emphasized. Various scholarly interpretations of the concepts of “competence” and “competency” are comparatively analyzed, and their impact on the effectiveness of pedagogical activity and the formation of students’ competencies—particularly in the context of foreign language teaching—is revealed.

Keywords: competence, competency, higher education, evolution of education, professional skills, effectiveness, modernization, retraining, information technologies, individual approach, teaching staff, Bologna Process, Lisbon Convention, cognitive and communicative abilities, adaptation.

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OLIY TA’LIMDA KOMPETENSIYAVIY YONDASHUVNING ILMIY-NAZARIY ASOSLARI VA METODIK JIHATLARI

Annotatsiya: Mazkur maqolada oliy ta’lim tizimida kompetensiyaviy yondashuvni joriy etishning zamonaviy ilmiy-nazariy asoslari va metodik yechimlari yoritiladi. Ta’lim jarayonini ilmiy-texnologik taraqqiyot sharoitida yangilash zarurati, bo‘lajak mutaxassislarni tayyorlashda kasbiy hamda shaxsiy kompetensiyalarning o‘rni asoslab beriladi. Xalqaro va milliy me‘yoriy-huquqiy hujjatlar, xususan, O‘zbekistonda 2030-yilgacha xalq ta’limini rivojlantirish konsepsiyasi tahlil qilinadi. Axborot-kommunikatsiya texnologiyalari va innovatsion metodlarni ta’limga integratsiyalashning ahamiyati ko‘rsatib beriladi. “Kompetensiya” va “kompetentlik” tushunchalariga doir turli ilmiy yondashuvlar qiyosiy tahlil qilinib, ularning pedagogik faoliyat samaradorligi hamda talabalar

kompetensiyalarini shakllantirishdagi roli, ayniqsa, xorijiy tillarni o'qitish jarayonida ochib beriladi.

Kalit so'zlar: kompetensiya, kompetentlik, oliy ta'lim, ta'lim evolyutsiyasi, kasbiy mahorat, samaradorlik, modernizatsiya, qayta tayyorlash, axborot texnologiyalari, individual yondashuv, pedagog kadrlar, Bolonya jarayoni, Lissabon konvensiyasi, kognitiv va kommunikativ qobiliyatlar, moslashuv.

Global ilmiy-texnologik taraqqiyot va ijtimoiy-iqtisodiy o'zgarishlar ta'lim tizimiga yangi talablarni qo'yimoqda. Zamonaviy jamiyat sharoitida ta'limning natijadorligi nafaqat bilimlar hajmi bilan, balki ularni real vaziyatlarda qo'llay olish, mustaqil qaror qabul qilish va moslashuvchanlik bilan belgilanadi. Shu sababli oliy ta'limda kompetensiyaviy yondashuv yetakchi metodologik asoslardan biri sifatida qaralmoqda.

Ta'lim tarixida bilimning amaliy qiymati doimo muhim bo'lgan. Hali qadimgi mutafakkirlar bilim faqat amaliyot bilan uyg'unlashgandagina haqiqiy ahamiyat kasb etishini ta'kidlaganlar. Bugungi kunda ham ta'lim tizimini rivojlantirish, pedagog kadrlarni zamonaviy talablarga mos tayyorlash va ularning malakasini oshirish dolzarb vazifalardan biridir.

O'zbekistonda ta'lim sohasini tubdan yangilashga qaratilgan islohotlar amalga oshirilmoqda. 2019-yilda tasdiqlangan "O'zbekiston Respublikasida 2030-yilgacha xalq ta'limini rivojlantirish konsepsiyasi" uzluksiz ta'lim tizimini modernizatsiya qilish, pedagog kadrlarning kasbiy kompetensiyalarini rivojlantirish hamda individual yondashuvni kuchaytirishni nazarda tutadi. Ushbu hujjatda AKTdan samarali foydalanish va innovatsion ta'lim texnologiyalarini joriy etish ustuvor yo'nalish sifatida belgilangan.

Xalqaro miqyosda esa Lissabon konvensiyasi va Bolonya deklaratsiyasi oliy ta'limda malaka va diplomlarning tan olinishi, ta'lim natijalarini kompetensiyalar orqali ifodalash tamoyillarini shakllantirdi. Bu hujjatlar kompetensiyaviy yondashuvning global standartlarga mosligini ta'minladi.

Ilmiy adabiyotlarda "kompetensiya" va "kompetentlik" tushunchalari turlicha izohlanadi. Ba'zi tadqiqotchilar ularni sinonim sifatida qo'llasa, boshqalari mazkur tushunchalarni farqlaydi. Kompetensiya ko'proq bilim, ko'nikma va malakalarning integratsiyalashgan majmuasi sifatida talqin qilinadi. Kompetentlik esa shaxsning ushbu resurslarni muayyan faoliyatda samarali qo'llay olish qobiliyatini ifodalaydi.

N.Xomskiy tomonidan kiritilgan lingvistik kompetensiya g'oyasi kompetensiyaviy yondashuvning nazariy poydevorini yaratdi. Olim kompetensiyani til tizimini bilish, performansni esa bu bilimni amalda qo'llash jarayoni sifatida ajratib ko'rsatgan. Keyinchalik ushbu yondashuv ta'limning boshqa sohalariga ham tatbiq etildi.

XX asr oxirlarida kompetensiyaviy yondashuv ta'lim natijalarini baholashning muhim mezoniga aylandi. J. Raven kompetentlikni kognitiv, emotsional va ijtimoiy komponentlarning murakkab tizimi sifatida talqin qilib,

uning kasbiy faoliyatdagi ahamiyatini asoslab berdi. Shuningdek, u universal va maxsus kompetensiyalar mavjudligini ko'rsatdi.

Mahalliy tadqiqotchilar tomonidan ham kompetensiyalar ierarxiyasi ishlab chiqilgan. Ushbu yondashuvga ko'ra, kompetensiyalar uch darajada namoyon bo'ladi: umumiy (kalit), sohaviy va fanlarga oid kompetensiyalar. Bunday tasnif ta'lim mazmunini tizimli rejalashtirishga imkon beradi.

Xorijiy tillarni o'qitishda kompetensiyaviy yondashuv ayniqsa muhim ahamiyatga ega. Bu jarayonda nafaqat lingvistik bilimlar, balki kommunikativ, sotsiokultural va pragmatik kompetensiyalarni shakllantirish zarur. Talabalarning mustaqil o'rganish, muloqotga kirishish va real kommunikativ vaziyatlarda tilni qo'llash qobiliyatlari rivojlantiriladi.

Pedagogning roli ham o'zgaradi: u bilim manbai emas, balki ta'lim jarayonini boshqaruvchi va yo'naltiruvchi subyektga aylanadi. O'qituvchining kasbiy kompetentligi talabalar faoliyatining samaradorligiga bevosita ta'sir ko'rsatadi.

Kompetensiyaviy yondashuv zamonaviy oliy ta'limning muhim metodologik asosidir. Ushbu yondashuv ta'lim jarayonini amaliy natijalarga yo'naltirish, talabalarning kasbiy va shaxsiy rivojlanishini ta'minlashga xizmat qiladi. Bilim, ko'nikma va malakalarning integratsiyasi bitiruvchilarning mehnat bozorida raqobatbardoshligini oshiradi. Shuning uchun oliy ta'lim tizimida kompetensiyaviy yondashuvni izchil joriy etish zamon talabi hisoblanadi.

Foydalanilgan adabiyotlar

1. Ahmedova L.T., Lagay E.A. *Rus tili va adabiyotini o'qitishning zamonaviy texnologiyalari*. Toshkent, 2016.
2. Belkin A.S. *Kompetentlik. Professionalizm. Mahorat*. Chelyabinsk, 2004.
3. Bobienko O.M. Kasbiy kompetensiyalar va mehnat bozori raqobatbardoshligi // *Journal of Modern Competition*, 2008.
4. Zeer E.F. *Shaxsning kasbiy-ta'limiy makoni*. Yekaterinburg, 2002.
5. Zimnyaya I.A. Zamonaviy ta'lim samaradorligi va kompetensiyalar // *Eidos elektron jurnali*.

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SUN'IY INTELLEKTNING (SI) TA'LIMDAGI O'RNI. IMKONIYATLARI VA KAMCHILIKLARI

Annotatsiya. Ushbu maqola hozirgi kunda hayotimizga kirib borayotgan Sun'iy ong ya'ni Suniy intellektning ta'limdagi o'rni keng yoritilgan bo'lib, ushbu zamonaviy texnologiyaning maktab o'quvchilari va oliy ta'limda qanday muhim o'rin tutishi, imkoniyatlari va salbiy taraflari muhokama qilingan.

Kalit so'zlar: Sun'iy intellekt (SI), maktab ta'limi, Oliy ta'lim, baholash tizimi, raqamli yordamchi, virtual ta'lim, avtomatik tekshirish.

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THE ROLE OF ARTIFICIAL INTELLIGENCE (AI) IN EDUCATION. ITS OPPORTUNITIES AND DISADVANTAGES.

Abstract. This article broadly covers the role of Artificial Intelligence, which is currently entering our lives, in education, and discusses the important role, opportunities and negative aspects of this modern technology in school students and higher education.

Keywords: Artificial Intelligence (AI), school education, Higher education, assessment system, digital assistant, virtual education, automatic testing.

Hozirgi kunda zamonaviy va insoniyat hayotidagi eng buyuk texnologiyalardan biri deb ta'riflanayotgan Sun'iy intellekt hayotimizning har jabhasida kundan kunga mukammal bo'lib gavdalanmoqda. Video roliklar yaratishdan tortib, ma'lumotlarni tahlil qilishgacha barcha vazifalarni inson omilisiz bajarmoqda. Mamlakatimizda ham ta'limga berilayotgan imkoniyatlar zamirida, raqobat bardosh texnologiyalar davrida yoshlarga Sun'iy intellekt bilimlarini o'rgatib borish eng dolzarb masalalardan biridir. Ushbu masalalarni hisobga olgan holda, O'zbekiston Respublikasi Prezidenti Sh.M.Mirziyoyevning "Sun'iy intellekt texnologiyalarini 2030-yilga qadar rivojlantirish strategiyasini tasdiqlash to'g'risida" 2024-yil 14-iyundagi PQ-358-son Qarori, shuningdek, "Sun'iy intellekt texnologiyalarini yanada rivojlantirishga oid qo'shimcha chora-tadbirlar to'g'risida" 2025-yil 22-oktabrdagi PF-189-son Farmonini ta'kidlash alohida o'rinlidir. Ushbu qarorda; Sog'liqni saqlash, energetika, bank-moliya, bojxona-soliq, transport, tog'-kon va qishloq xo'jaligi sohalarida sun'iy intellekt bo'yicha 100 ta loyiha rejalashtirilgan. Ularni amalga oshirish uchun shunga mos quvvatlar,

zamonaviy super kompyuterlar kerak. Lekin hozirgi mavjud quvvatlar faqat kichik loyihalarni ishga tushirish uchun yetadi.

Shu bois, zamonaviy super kompyuter klasterlari va "Data-markaz"larni ko'paytirish zarurligi qayd etildi. Bu yil 16 ta super kompyuter sotib olish uchun 50 million dollar ajratildi. Keyingi yil bu mablag' 2 karra oshiriladi.

Sohaga investitsiyalarni rag'batlantirish uchun Qoraqalpog'istonda imtiyozli rejim joriy qilinishi belgilandi. Sun'iy intellekt infratuzilmasiga 100 million dollardan ko'p sarmoya kiritgan investorlarga elektr energiyasining narxi 5 sent etib belgilanadi, IT-park imtiyozlari tatbiq etiladi, import uskunalari bojxona to'lovidan ozod etiladi. Shu bilan birga, olis hududlarni yuqori tezlikdagi internet bilan ta'minlash uchun keyingi yildan "sputnik internet" operatorlarining faoliyati yo'lga qo'yiladi. Ular besh yilga yer, mol-mulk, foyda va qo'shilgan qiymat solig'idan ozod etiladi.

Sun'iy intellekt (SI) – bu kompyuter tizimlarining inson kabi o'rganishi, tahlil qilishi va qaror qabul qilish qobiliyatidir. Ta'limda SI o'quv jarayonini shaxsiylashtirish, o'qitish sifatini oshirish va o'qituvchining yukini yengillashtirish uchun qo'llanilmoqda. SI ning ta'limdagi asosiy vazifalaridan biri – individual yondashuvni ta'minlashdir. An'anaviy sinfda barcha o'quvchilar bir xil tezlikda o'qiydi, lekin SI tizimlari har bir o'quvchining bilim darajasi, xatolari va o'rganish uslubini tahlil qilib, unga mos topshiriqlarni beradi. Sun'iy intellekt o'quvchilarning bilim darajasi, qiziqishi va o'zlashtirish tezligini tahlil qilib, har bir o'quvchi uchun mos ta'lim yo'nalishini taklif etadi. Bu esa: bilimdagi bo'shliqlarni aniqlash, Shaxsiy o'quv rejasini yaratish, O'quvchining mustaqil rivojlanishiga yordam beradi. SI test natijalari, yozma ishlar va faoliyatni avtomatik baholay oladi. Bu: O'qituvchining vaqtini tejaydi, Baholashda xolislikni ta'minlaydi, Real vaqt rejimida tahlil qilish imkonini beradi.

SI ta'limda o'quvchilarga ko'plab afzalliklarni beradi, jumladan; ta'lim sifati oshadi, o'quvchida markazli ta'lim shakllanadi, o'qituvchilarning yuklamasi kamayadi, masofaviy ta'lim rivojlanadi, ta'limda teng imkoniyatlar yaratiladi.

Shu bilan birga o'quvchi biror ma'lumot yoki manbaani, internetdan yoki, ijtimoiy tarmoqlardan qidirganda ko'proq vaqt yo'qotishi mumkin, SI berilgan savolga aniq javob beradi, o'quvchi va o'qituvchining vaqtini tejaydi. Ta'lim jarayonida sun'iy intellektning qo'llanilishi quyidagi imkoniyatlarga yoki holatlarga olib kelishi mumkin. Shaxsiylashtirilgan ta'lim, SI o'quvchilarning bilim darajasi, qiziqishlari va o'rganish tezligini tahlil qilib, har bir o'quvchi uchun mos o'quvchi. Bu esa bilimni chuqurroq va samaraliroq o'zlashtirishga yordam beradi. Avtomatik baholash tizimlari, testlar, yozma ishlar va uy vazifalarini tekshirish orqali o'qituvchilarning vaqti tejaladi. Shu bilan birga, baholashda inson omili sababli yuzaga keladigan xatolar kamayadi. Virtual yordamchilar va tyutorlar, chatbotlar va virtual o'qituvchilarga 24/7 rejimida savollarga javob berishi, murakkab mavzularni tushuntirishi mumkin. Bu ayniqsa masofaviy ta'limda muhim ahamiyatga ega. Ta'limdagi tahlil, SI yordamida o'quvchilarning o'zlashtirish darajasi tahlil qilinadi, qaysi mavzularda qiyinchilik borligi aniqlanadi va o'qituvchiga aniq tavsiyalar beriladi. Sun'iy intellektning afzalliklari, Ta'lim sifati

va samaradorligi oshadi, o'quvchilarning mustaqil o'rganish qobiliyati rivojlanadi, o'qituvchilarning yuklamasi kamayadi, masofaviy ta'lim imkoniyatlari kengayadi.

Muammolar va xavotirlar shundan iboratki, SI ta'limda ayrim muammolarni ham keltirib chiqarishi mumkin: O'quvchilarning haddan tashqari texnologiyaga bog'lanib qolishi. Akademik halollik (plagiat, avtomatik javoblar) muammosi. Texnologiyaga teng kirish imkoniyatining yo'qligi, o'qituvchining tarbiyaviy roli kamayib ketish xavfi yuqori bo'lib turibdi.

Xulosa:

Sun'iy intellekt ta'lim sohasida katta imkoniyatlar yaratmoqda. U to'g'ri va mas'uliyat bilan qo'llanilganda, ta'lim sifatini oshirish, bilim olish jarayonini qulay va samarali qilishda muhim vositaga aylanadi. Biroq SI o'qituvchini to'liq almashtira olmaydi, balki uni qo'llab-quvvatlovchi yordamchi sifatida xizmat qilishi lozim. SI o'quvchiga ta'lim berishi mumkin, biroq, uni nazorat qilolmaydi va tarbiyaviy jihatdan uning o'rnini egallay olmaydi.

FOYDALANILGAN ADABIYOTLAR.

1. O'zbekiston Respublikasi Prezidentining "Sun'iy intellekt texnologiyalarini 2030-yilga qadar rivojlantirish strategiyasini tasdiqlash to'g'risida" 2024-yil 14-iyundagi PQ-358-son Qarori.
2. O'zbekiston Respublikasi Prezidentining "Sun'iy intellekt texnologiyalarini yanada rivojlantirishga oid qo'shimcha chora-tadbirlar to'g'risida" 2025-yil 22-oktabrdagi PF-189-son Farmoni.
3. Ahmad, M.F.; Gapar. "Malayziya oliy ta'limida sun'iy intellekt davri: o'z-o'zini kashf qilish ta'limi uchun aralash haqiqat moddiy ta'lim tizimidagi ta'sir va muammolar". Procedia kompyuter. 2019, 163, 2-10.

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INTELLEKTUAL MULK VA KAPITAL TUSHUNCHASI

Annotatsiya: Maqolada intellektual mulk va kapital tushunchalariga alohida e'tibor bergan holda yondashilganligini hamda ushbu tushunchalarning o'rni va ahamiyati xususida so'z boradi.

Kalit so'zlar: Intellektual mulk, intellektual huquq, intellektual faoliyat.

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THE CONCEPT OF INTELLECTUAL PROPERTY AND CAPITAL

Abstract: The article discusses the approach with special attention to the concepts of intellectual property and capital, as well as the place and significance of these concepts.

Keywords: Intellectual property, intellectual law, intellectual activity.

Intellektual faoliyat natijalarining yangi mahsulotlar, xizmatlar va texnologiyalarda ifoda etuvchi qiymatga transformatsiyalanishi asosida innovatsion iqtisodiyot va bilimlar iqtisodiyotining taraqqiyoti jadallashadi va uning ko'lamlari tobora kengayib boradi. Raqobatbardosh mahsulot ishlab chiqarishda intellektual resurslar ahamiyatining ortib borishi mahsulot ishlab chiqarish usullarining o'zgarishiga, bilimlarning yangi qiymat yaratilishida eng muhim omilga aylanishiga olib keladi.

Innovatsion biznes muvaffaqiyatining asosiy omillaridan biri intellektual faoliyat natijalariga egalik qilish hisoblanadi, shu sababli ham, zamonaviy kompaniyalarning raqobatbardoshligi va serdaromadlilik darajasi ko'p jihatdan, intellektual mulk sifatidagi resurslarning mavjudligi bilan belgilanadi.

Mamlakatimiz qonunchiligiga binoan, intellektual faoliyat natijalari va ularga tenglashtirilgan, ayni paytda huquqiy himoya ta'min etiluvchi tovarlar, xizmatlar, shaxsiylashtirish vositalari kabilar intellektual mulk sifatida tushuniladi. Xususan, O'zbekiston Respublikasi Fuqarolik Kodeksining 97-moddasida intellektual faoliyat natijalariga quyidagicha ta'rif berilgan: Ushbu Kodeks va boshqa qonunlarda belgilangan hollarda va tartibda intellektual faoliyatning aniq ifoda etilgan natijalari hamda yuridik shaxsning bu natijalarga tenglashtirilgan o'ziga xos vositalari, ana shu ishlar yoki xizmatlarni ado etayotgan jismoniy yoki yuridik shaxsning mahsulotlari (firma nomi, tovar

belgisi, xizmat ko'rsatish belgisi va hokazo)ga nisbatan fuqaroning yoki yuridik shaxsning mutlaq huquqi e'tirof etiladi.

Mutlaq huquq ob'yekti bo'lgan intellektual faoliyat natijalari va o'ziga xos vositalaridan uchinchi shaxslar huquq egasining ruxsati bilangina foydalanishlari mumkin. Boshqacha aytganda, intellektual mulk – tegishli huquqiy mexanizmlar bilan himoyalangan intellektual aktivlar hisoblanadi. Intellektual mulk muhofazasining mustahkam tizimiga ega bo'lishi lozim.

Intellektual mulk muhofazasi ixtirochilar va ijodkorlarni qo'llab-quvvatlash, ularning yangiliklaridan foydalanish uchun sohaga investitsiyalarni jalb qilishni taqozo etadi. O'zbekiston Respublikasining Fuqarolik kodeksining 1031-moddasiga ko'ra, intellektual mulk obyektlari uch guruhga bo'linadi:

1. Intellektual faoliyat natijalari:

- fan, adabiyot va san'at asarlari;
- ijrolar, fonogrammalar, efir yoki kabel orqali ko'rsatuv yoxud eshittirish beruvchi tashqilotlarning ko'rsatuvlari yoki eshittirishlari;
- elektron hisoblash mashinalari uchun dasturlar va ma'lumotlar bazalari;
- ixtirolar, foydali modellar va sanoat namunalari;
- seleksiya yutuqlari;
- oshkor etilmagan axborot, shu jumladan ishlab chiqarish sirlari (nou-xau).

2. Fuqarolik muoamalasi ishtirokchilarining tovarlar, ishlar va xizmatlarning xususiy alomatlarini aks ettiruvchi vositalar:

- firma nomlari;
- tovar belgilari (xizmat ko'rsatish belgilari);
- tovarlar chiqarilgan joy nomi.

3. Intellektual faoliyatning boshqa natijalari hamda fuqarolik muoamalasi ishtirokchilarining tovarlar va xizmatlarning xususiy alomatlarini aks ettiruvchi vositalar.

Bugungi kunda butun dunyoda intellektual mulk obyektlarini tarkiblarga ajratish, obyektlarga huquqiy rejim berish, huquq egalari manfaatlarini himoya qilish tizimini soddalashtirish orqali kodifikatsiya jarayoni olib borilayotgani ko'zga tashlanmoqda.

Bizning intellektual mulk obyektlarini huquqiy muhofazalash sohasida amaldagi qonunchiligimiz bevosita mulkka egalik va ilmiy-texnik ijodiyot erkinligi huquqlari ifoda etgan Konstitutsiyaning IX bo'limi 36 va 42 moddalaridan kelib chiqqan holda ishlab chiqilgan. Intellektual mulk obyektlarini yaratish, muhofazalash va foydalanish bilan bog'liq huquqiy munosabatlar fuqarolik huquqi sohasi hisoblanadi va O'zbekiston Respublikasining Fuqarolik kodeksi bilan tartibga solinadi.

Mamlakatimizda xalqaro amaliyotdan kelib chiqqan holda, huquqiy muhofaza qilinuvchi intellektual mulk obyektlariga quyidagilar kiritilgan:

- 1), ilm-fan, adabiyot va san'at asarlari;
- 2) elektron hisoblash mashinalari uchun dasturlar;
- 3) ma'lumotlar bazalari;
- 4) ijro;

- 5) fonogramma;
- 6) efir orqali xabarlar yuborish yoki kabel orqali radio eshittirish va teleko'rsatuvlar uzatish;
- 7) ixtirolar;
- 8) foydali modellar;
- 9) sanoat namunalari;
- 10) seleksiya yutuqlari,
- 11) integral mikrosxemalar,
- 12) tijorat sirlari (nou-xau);
- 13) firma nomlari,
- 14) tovar va xizmat ko'rsatish belgilari,
- 15) tovarlarning kelib chiqishi bo'yicha joy nomlari;
- 16) tijorat-savdo belgilari.

Intellectual mulk obyektlarining bu yopiq ro'yxati intellektual faoliyatning barcha natijalari muhofaza qilinishini anglatmaydi, o'z navbatida barcha bilimlarni ikki katta guruhga bo'lishimiz mumkin bo'ladi: 1) amaldagi huquqiy mexanizmlar orqali muhofaza qilish imkoni mavjud bo'lmagan bilimlar (g'oyalar, nazariyalar, kashfiyotlar);

2) muhofazalanadigan bilimlar.

Muhofazalanadigan bilimlar o'z navbatida qandaydir sabablar bilan muhofazalanmasdan qolgan va huquqiy jihatdan himoyalangan intellektual mulkka bo'linadi. Amaldagi qonunchilik intellektual faoliyat natijalarini himoyalash borasida turli intellektual mulk obyektlarini tasarruf etish, foydalanish va ularga egalik qilish tartibini belgilab beruvchi turli huquqlar (mualliflik huquqi, patent huquqi va hokazo) larni ko'zda tutadi.

Mualliflik huquqi quyidagi biron-bir obyektiv shaklda bo'lgan oshkor qilingan asarlarga ham, oshkor qilinmagan asarlarga ham tatbiq etiladi:

- yozma (qo'lyozma, mashinkalangan yozuv, notali yozuv va hokazo);
- og'zaki (omma oldida so'zlash, omma oldida ijro etish va hokazo);
- ovozli yoki video yozuv (mexanik, magnitli, raqamli, optik va hokazo);
- tasvir (rasm, eskiz, manzara, tarh, chizma, kino, tele, video yoki fotokadr va hokazo);
- hajmli-fazoviy (haykal, model, maket, inshoot va hokazo);
- boshqa shakllardagi.

Mualliflik huquqi g'oyalar, prinsiplar, uslublar, jarayonlar, tizimlar, usullar yoki konsepsiyalarga emas, balki ifoda shakliga nisbatan tatbiq etiladi.

Xulosa qib aytganda, intellektual mulkni huquqiy muhofazalash tizimi ilmiy-texnik va ijodiy faoliyat erkinligini ta'minlaydi, iqtisodiy rivojlanishga xizmat qiladi hamda innovatsion jamiyat barpo etishning muhim huquqiy asosini tashkil etadi.

Foydalanilgan adabiyotlar ro'yhati

1. O'zbekiston Respublikasining Konstitutsiyasi, Toshkent, —O'zbekiston NMIU, 2023 -yil.
2. O'zbekiston Respublikasining Fuqarolik kodeksi.

3. O'zbekiston Respublikasining —Mualliflik va turdosh huquqlar to'g'risidagi Qonuni. 2006-yil
- 4.O'zbekiston Respublikasining —Tovar belgilari, xizmat ko'rsatish belgilari va tovar kelib chiqqan joy nomlari to'g'risidagi Qonuni. –T.: 2001, 89 b.
- 5.O'zbekiston Respublikasining «Ixtirolar, foydali modellar va sanoat namunalari to'g'risida»gi Qonuni. –T.: 2002, 117 b.
6. O'zbekiston Respublikasining O'RQ-312-son 2011-yil 26- dekabrda qabul qilingan - Intellektual mulk to'g'risidagi qonun hujjatlari takomillashtirilishi munosabati bilan O'zbekiston Respublikasining ayrim qonunlariga o'zgartish va qo'shimchalar kiritish haqidagi Qonuni. –T.: 2011, 94 b.

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INTELLEKTUAL MULKNI XALQARO HUQUQIY HIMOYA QILISH MASALALARI

Annotatsiya: *Maqolada intellektual mulkni himoya qilish jarayonida xalqaro huquqning asosiy masalalari, intellektual mulkni himoya qilish borasida yurtimizda amalga oshirilayotgan islohotlar hususida soʻz boradi.*

Kalit soʻzlar: *Kapital, mulk, intellektual qobiliyat, intellektual salohiyat, bilim, ijod, ijodiy salohiyat, iqtisodiy samara, ragʻbatlantirish, ixtiro, patent, mulkchilik huquqi, mualliflik huquqi, xalqaro shartnomalar, xalqaro-kelishuvlar.*

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ISSUES OF INTERNATIONAL PROTECTION OF INTELLECTUAL PROPERTY

Abstract: *The article discusses the main issues of international law in the process of intellectual property protection and the reforms being implemented in our country regarding the protection of intellectual property.*

Keywords: *Capital, property, intellectual ability, intellectual potential, knowledge, creativity, creative potential, economic effect, incentives, invention, patent, property rights, copyright, international treaties, international agreements.*

Hozirgi shiddatli bir davrda har bir davlatning rivojlanishida har tomonlama asqotadigan texnologiyalar oʻzining oʻrniga egadir. Jumladan, har bir davlatning asosini tashkil etuvchi intellektual salohiyatli insonlari. Bugungi texnologik taraqqiyotda intellektual mulk har bir mamlakat iqtisodiyotining rivojlanishida ayniqsa katta ahamiyat kasb etayotganligi, har bir davlatning dunyo iqtisodiyotdagi yanada raqobatbardoshligini belgilab bermoqda. Shundan kelib chiqqan holda aytish lozimki, intellektual mulkning iqtisodiyotga keltiradigan foydasini quyidagi misol orqali koʻrishimiz mumkindir. 2022 yil AQShda umurtqa mushak atrofiyasini davolash uchun yangi dori vositasi ishlab chiqilgan boʻlib, uning patent narxi 3 million AQSh dollaridan oshadi, bu dunyodagi eng qimmat dori hisoblanadi.

Hozirgi davrda Yangi Oʻzbekistonda ham intellektual mulkni har tomonlama yanada rivojlantirish va uni har tomonlama mustahkam huquqiy himoya qilish borasida bir qator amaliy ishlar qilinmoqda. Intellektual mulk agentligi 2019 yilda Adliya vazirligi tizimiga oʻtkazilgani natijasida ushbu sohani takomillashtirish

bo'yicha keng ko'lamli ishlar amalga oshirildi. Adliya vazirligi tashabbusi bilan intellektual mulk sohasini rivojlantirish maqsadida tizimli islohotlar amalga oshirib kelinmoqda. Bugungi kunda intellektual mulkning yaratilishi va uning huquqiy muhofazasi bo'yicha ishlarning tashkillashtirilishi dunyo mamlakatlarida davlat siyosatiga aylandi. Chunki, har qanday davlatning rivojlanish darajasi, uning dunyo hamjamiyatidagi nufuzi, aynan intellektual mulk bo'yicha olib borayotgan ishlari qanday darajada olib borilishiga, yangi texnika-texnologiyalar yaratilishiga bog'liqdir. O'zbekiston o'zining rivojlangan intellektual mulk bazasi, ya'ni, intellektual kapitali bilan dunyoga tanilgan mamlakatdir. U yuqori malakali kadrlari bilan Markaziy Osiyodagi katta salohiyatga ega bo'lgan ilmiy markaz hisoblanadi. Biroq, O'zbekiston Respublikasi Oliy Majlis Senati raisi Tanzila Norboyevaning ta'kidlashicha: "Jahon intellektual mulk tashkiloti tomonidan "Global innovatsion indeks" bo'yicha davlatlar reytingi yuritilishini bilamiz. Ushbu reytingga 129 ta mamlakat kirgan. Qo'shni mamlakatlardan Qozog'iston, Qirg'iziston, Tojikiston kirgan. Lekin O'zbekiston mazkur reytingda o'rin egallay olmagan". Bunday holat, tabiiyki, yirik intellektual kapitalga ega bo'lgan O'zbekiston uchun davomli bo'lishi mumkin emas. Shu sababdan, O'zbekiston Respublikasi Prezidentining 2018 yil 21 sentyabrdagi PF-5544-son Farmoni bilan 2019-2021 yillarda ilmiy va innovatsion faoliyatdagi mavjud kamchiliklarni bartaraf etish, mamlakatning xalqaro maydondagi raqobatbardoshlik darajasini ko'tarish va uning innovatsion jihatdan taraqqiy etishini ta'minlovchi asosiy omil - inson kapitalini rivojlantirishga qaratilgan Strategiya ishlab chiqildi. Strategiyaning bosh maqsadi 2030 yilga kelib mamlakatimizni Global innovatsion indeks reytingi bo'yicha jahonning 50 ilg'or davlatlar qatoriga kiritish hisoblanadi. Strategiyaning asosiy yo'nalishlari etib quyidagilar belgilangan:

- fan, ixtirochilik va texnologiyalar transferini rivojlantirish;
- innovatsion faoliyatni moliyalashtirish tizimini takomillashtirish;
- infratuzilma va axborot-kommunikatsiya texnologiyalarini rivojlantirish;
- ta'lim tizimini takomillashtirish va inson kapitalini rivojlantirish;
- raqobatni rivojlantirish va ma'muriy to'siqlarni kamaytirish.

Yangi O'zbekiston o'zining fan va texnologiyalari rivojlanishini dunyo hamjamiyati bilan hamkorlikda, o'zaro kelishuv asosida olib bormoqda. Jumladan, 1996 yil 20 dekabrda Butunjahon intellektual mulk tashkiloti (BIMT) doirasida qabul qilingan Ijrolar va fonogrammalar bo'yicha shartnoma hamda Mualliflik huquqi to'g'risidagi shartnoma 2019 yilning 17 iyul kuni O'zbekiston Respublikasi uchun kuchga kirdi.

Dunyoda 101 mamlakat va Yevropa Ittifoqi BIMTning mazkur ikki shartnomasi ishtirokchisi hisoblanadi. BIMT Birlashgan Millatlar Tashkiloti (BMT) tizimi tarkibiga 1974 yilning dekabr oyidan e'tiboran kiruvchi ixtisoslashgan muassasasidir. Ushbu shartnomalar "Internet sohasida BIMT shartnomalari" nomi bilan ham mashhur bo'lib raqamli muhitda mualliflik huquqi va aralash huquqlar himoyasining asosiy mezonlarini belgilaydi. "Internet sohasida BIMT shartnomalari" mualliflik huquqiy kontentni interaktiv tarzda yetkazish, mualliflik huquqiy himoyani cheklash va ijodiy mahsulotlarni tarqatish va foydalanishga

imkon beruvchi texnologiyalarga ko'maklashish kabi sohalarda yangi texnologik nuqtai nazardan muvofiqlashgan himoya tizimiga zamin yaratgan.

Yurtimizda "O'zbekiston Respublikasining 1968 yil 8 oktyabrda Lokarnoda imzolangan Sanoat na'munalarining xalqaro tasnifini ta'sis etish to'g'risidagi Lokarno bitimiga qo'shilishi haqida"gi, "O'zbekiston Respublikasining 2000 yil 1 iyulda Jenevada Diplomatik konferensiya tomonidan qabul qilingan Patent huquqi to'g'risidagi Shartnomaga qo'shilishi haqida"gi qonunlar qabul qilingan. Shuningdek, O'zbekiston Rio Deklaratsiyasiga, Birlashgan Millatlar Tashkilotining iqlim o'zgarishi, biologik turli xillik, saholanishga qarshi Konventsiyasiga, ozon qatlamini himoyalash Vena Konventsiyasiga, xavfli chiqindilarning tashilishi va chiqarilishini nazorat qilish Bazel Konventsiyasiga qo'shib ratifikatsiya qilgan. O'zbekiston Respublikasi savdo markalarini ro'yxatdan o'tkazish to'g'risidagi Madrid Kelishuvining ham a'zosi hisoblanadi.

Mustaqil Davlatlar Hamdo'stligi (MDH) ga kirgan davlatlar hududida intellektual mulk sohasida ro'y berishi mumkin bo'lgan huquqbuzarlikning oldini olish maqsadida O'zbekiston maxsus bitimga qo'shildi va sanoat mulkini himoya qilish bo'yicha – Rossiya Federatsiyasi (1995 yil. 27 iyun), Gruzziya Respublikasi (1996 yil 28 may), Qirg'iziston Respublikasi (1996 yil 24 dekabr), Qozog'iston Respublikasi (1997 yil 2 iyun), Ozarbayjon Respublikasi (1997 yil 18 iyun), shuningdek, intellektual mulkni muhofaza qilish sohasida Ukraina (1998 yil 19 fevral) va Turkiya Respublikasi (1998 yil 13 aprel) bilan ikkitomonlama shartnomalar tuzdi. O'zbekistonda sotsial-iqtisodiy rivojlanishga qaratilgan keng ko'lamli ishlarni amalga oshirishda intellektual mulkdan samarali foydalanishga e'tibor kuchli bo'lmoqda. O'zbekiston Respublikasi Prezidentining 2018 yil 14 iyuldagi "Ilmiy va ilmiy-texnikaviy faoliyat natijalarini tijoratlashtirish samaradorligini oshirish bo'yicha qo'shimcha chora-tadbirlar to'g'risida"gi PQ-3855-sonli Qarorida mamlakatimiz Tashqi ishlar vazirligi muassasalar tomonidan ilmiy va ilmiy-texnikaviy faoliyat natijalarini xorijda tijoratlashtirishga, shuningdek, ularni xalqaro bozorlarda ilgari surishga diplomatik vositalar orqali ko'maklashishi belgilangan.

Xulosa sifatida aytish mumkinki, mamlakatimizda ilmiy va ilmiy-texnikaviy faoliyatni amalga oshirish, ilmiy-texnikaviy va innovatsion rivojlanishni ta'minlash uchun qulay shart-sharoitlarni yaratishda keng ko'lamli ishlar olib borilmoqda.

Foydalanilgan adabiyotlar ro'yxati

- 1.O'zbekiston Respublikasining Konstitutsiyasi, Toshkent, —O'zbekiston NMIU, 2023-yil.
- 2.O'zbekiston Respublikasining Fuqarolik kodeksi.
- 3.O'zbekiston Respublikasining —Mualliflik va turdosh huquqlar to'g'risidagi Qonuni. 2006-yil.
- 4.O'zbekiston Respublikasining —Tovar belgilari, xizmat ko'rsatish belgilari va tovar kelib chiqqan joy nomlari to'g'risidagi Qonuni. –T.: 2001, 89 b.
- 5.O'zbekiston Respublikasining «Ixtirolar, foydali modellar va sanoat namunalari to'g'risida»gi Qonuni. –T.: 2002, 117 b.

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O'QUVCHI YOSHLARNI KASB-HUNARGA YO'NALTIRISHDA XALQ HUNARMANDCHILIGINING AHAMIYATI

Annotatsiya: Mazkur maqolada o'quvchi yoshlarni kasb-hunarga yo'naltirish jarayonida xalq hunarmandchiligining pedagogik, ijtimoiy va iqtisodiy ahamiyati yoritilgan. Tadqiqotda Prezident Sh. Mirziyoyevning yoshlarga oid g'oyalari va Maktabgacha va maktab ta'limi vazirligining 2025-yil 15-maydagi 152-son buyrug'i mazmuni tahlil qilinib, xalq hunarmandchiligi asosida kasbiy kompetensiyalarni shakllantirish imkoniyatlari ilmiy asoslangan.

Kalit so'zlar: kasb-hunar, xalq hunarmandchiligi, kasbiy yo'naltirish, milliy qadriyatlar, o'quvchi yoshlar.

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THE IMPORTANCE OF FOLK CRAFTS IN STUDENT PROFESSIONAL GUIDANCE

Abstract: This article highlights the pedagogical and socioeconomic significance of folk crafts in student career guidance. The study analyzes President Shavkat Mirziyoyev's ideas regarding youth and the content of Order No. 152 of the Ministry of Preschool and School Education dated May 15, 2025, and provides a scientific justification for developing professional competencies based on folk crafts.

Keywords: profession, folk crafts, career guidance, national values, students.

Kirish

Bugungi globallashuv sharoitida o'quvchi yoshlarni mehnatsevar, kasb egasi, raqobatbardosh shaxs sifatida tarbiyalash ta'lim tizimining muhim vazifalaridan biri hisoblanadi. Ayniqsa, milliy qadriyatlar va an'analar asosida kasb-hunarga yo'naltirish yoshlarning qiziqishi va ijtimoiy moslashuvini oshirishda muhim ahamiyat kasb etadi. Shu nuqtayi nazardan, xalq hunarmandchiligi o'quvchilarni kasb-hunarga yo'naltirishda samarali vosita bo'lib xizmat qiladi.

O'quvchi yoshlarni ongli ravishda kasb-hunarga yo'naltirish dolzarb pedagogik muammolardan biri hisoblanadi. Ta'lim tizimida olib borilayotgan islohotlar yoshlarning bozor iqtisodiyoti talablariga mos, raqobatbardosh kasb egasi

bo‘lib yetishishini taqozo etmoqda. Shu jarayonda xalq hunarmandchiligi yoshlarni kasb-hunarga yo‘naltirishning muhim vositasi sifatida alohida ahamiyat kasb etadi.

O‘zbekiston hududida qadimdan rivojlangan kulolchilik, zardo‘zlik, kashtachilik, yog‘och o‘ymakorligi, naqqoshlik kabi hunarmandchilik turlari nafaqat moddiy boylik, balki yoshlar tarbiyasida muhim pedagogik resurs bo‘lib xizmat qiladi.

Asosiy qism

1. Prezident Sh. Mirziyoyev Murojaatnomasida yoshlar va kasb-hunar masalasi

Prezident Sh. Mirziyoyev o‘z Murojaatnomalarida yoshlarni kasb-hunarli qilish, ularni mehnat bozoriga mos mutaxassis sifatida tayyorlash masalasiga alohida e‘tibor qaratadi. Davlat rahbari yoshlarning qobiliyat va qiziqishlarini erta aniqlash, ularni milliy va zamonaviy kasblarga yo‘naltirish orqali bandlikni ta‘minlash muhimligini ta‘kidlaydi. Bu borada hunarmandchilik, amaliy san‘at, oilaviy tadbirkorlik kabi sohalar yoshlar uchun istiqbolli yo‘nalish sifatida ko‘rsatiladi.

Kasb-hunarga yo‘naltirish — bu o‘quvchilarning qiziqishlari, qobiliyatlari va ehtiyojlarini hisobga olgan holda ularni ongli kasb tanlashga tayyorlash jarayonidir. Ushbu jarayon uzluksiz bo‘lib, boshlang‘ich sinflardan boshlab amalga oshiriladi. Kasb-hunarga yo‘naltirishda amaliy faoliyatga asoslangan mashg‘ulotlar o‘quvchilarda mehnatga nisbatan ijobiy munosabatni shakllantiradi.

Xalq hunarmandchiligi esa aynan amaliy faoliyatga tayangan holda kasbiy tasavvurlarni rivojlantirish imkonini beradi.

2. MMTVning 2025-yil 15-maydagi 152-son buyrug‘ining mazmuni

Mazkur buyruqda umumiy o‘rta ta‘lim muassasalarida o‘quvchilarni kasb-hunarga yo‘naltirish ishlarini takomillashtirish, milliy hunarmandchilik turlarini ta‘lim jarayoniga integratsiya qilish vazifalari belgilangan. Buyruq asosida maktablarda hunarmandchilik to‘garaklari, amaliy mashg‘ulotlar va ustoz-shogird an‘analari yo‘lga qo‘yilishi nazarda tutilgan. Bu esa o‘quvchilarda mehnat ko‘nikmalari, kasbiy qiziqish va ijodiy tafakkurni rivojlantirishga xizmat qiladi.

3. Xalq hunarmandchiligining kasbiy yo‘naltirishdagi ahamiyati

Xalq hunarmandchiligi o‘quvchi yoshlarni kasb-hunarga yo‘naltirishda quyidagi jihatlar bilan ahamiyatlidir:

— o‘quvchilarda milliy qadriyatlarga hurmat va faxr tuyg‘usini shakllantiradi;

— amaliy faoliyat orqali kasbiy ko‘nikmalarni rivojlantiradi;

— mehnatsevarlik, sabr-toqat va mas‘uliyat kabi fazilatlarni tarbiyalaydi;

— kelajakda tadbirkorlik faoliyatiga yo‘naltiradi.

Naqqoshlik, kashtachilik, kulolchilik, yog‘och o‘ymakorligi kabi hunarmandchilik turlari o‘quvchilar uchun qiziqarli va foydali kasbiy yo‘nalish bo‘lib, ularni mehnat bozoriga moslashtiradi.

Xalq hunarmandchiligi yoshlarni quyidagi jihatlar asosida tarbiyalaydi:

— mehnatsevarlik va sabr-toqatni shakllantiradi;

— estetik did va ijodiy tafakkurni rivojlantiradi;

- milliy qadriyatlar va anʼanalarga hurmat uygʻotadi;
- mustaqil faoliyat yuritish koʻnikmalarini hosil qiladi.

Hunarmandchilik bilan shugʻullangan oʻquvchi nafaqat muayyan buyum yaratadi, balki kelajak kasbi haqida real tasavvurga ega boʻladi. Bu esa kasb tanlashda ongli qaror qabul qilishga yordam beradi.

Tadqiqot natijalari

Tadqiqot natijalari shuni koʻrsatdiki, xalq hunarmandchiligi asosida tashkil etilgan mashgʻulotlar oʻquvchilarning kasb-hunarga boʻlgan qiziqishini sezilarli darajada oshiradi, ularning ijodiy va amaliy kompetensiyalarini rivojlantiradi. Shuningdek, bu yoʻnalishdagi taʼlim oʻquvchilarning kelajak kasbini ongli tanlashiga ijobiy taʼsir koʻrsatadi.

Umumtaʼlim maktablarida texnologiya, tasviriy sanʼat, mehnat taʼlimi fanlari orqali xalq hunarmandchiligi elementlarini joriy etish mumkin. Amaliy mashgʻulotlar, ustoz-shogird anʼanalari, hunarmandlar bilan uchrashuvlar tashkil etish oʻquvchilarning kasbiy qiziqishini oshiradi.

Shuningdek, toʻgaraklar faoliyati orqali hunarmandchilikka oid koʻnikmalarni rivojlantirish yoshlarning boʻsh vaqtini mazmunli tashkil etishga xizmat qiladi.

Tadqiqot metodlari

Maqolada tahlil va sintez, pedagogik kuzatuv, suhbat, ilgʻor tajribalarni oʻrganish hamda taqqoslash metodlaridan foydalanildi.

Xulosa

Xulosa qilib aytganda, oʻquvchi yoshlarni kasb-hunarga yoʻnaltirishda xalq hunarmandchiligi muhim pedagogik va ijtimoiy ahamiyatga ega. Prezident Sh. Mirziyoyev Murojaatnomasi va MMTVning 2025-yil 15-maydagi 152-son buyrugʻi talablari asosida hunarmandchilikni taʼlim jarayoniga keng joriy etish yoshlarning bandligini taʼminlash, milliy qadriyatlarni asrash va barkamol avlodni tarbiyalashga xizmat qiladi. Xalq hunarmandchiligi oʻquvchi yoshlarni kasb-hunarga yoʻnaltirishda muhim tarbiyaviy va amaliy ahamiyatga ega. Uni taʼlim jarayoniga keng joriy etish orqali yoshlarning kasbiy kompetensiyalarini rivojlantirish, milliy qadriyatlarga sodiq, mehnatsevar va ijodkor shaxslarni tarbiyalash mumkin. Shu bois xalq hunarmandchiligi asosidagi taʼlim-tarbiyaviy faoliyatni yanada takomillashtirish dolzarb vazifalardan biridir.

Foydalanilgan adabiyotlar

1. Mirziyoyev Sh.M. Oʻzbekiston Respublikasi Prezidentining Oliy Majlisga Murojaatnomasi. – Toshkent.
2. Mirziyoyev Sh.M. Yangi Oʻzbekiston taraqqiyot strategiyasi. – Toshkent, 2022.
3. Oʻzbekiston Respublikasi Maktabgacha va maktab taʼlimi vazirligi. 2025-yil 15-maydagi 152-son buyruq.
4. Oʻzbekiston Respublikasi Prezidentining yoshlarni kasb-hunarga yoʻnaltirishga oid qarorlari.
5. Xalq hunarmandchiligi va kasbiy taʼlimga oid metodik qoʻllanmalar.
6. Pedagogika nazariyasi va amaliyoti boʻyicha oʻquv qoʻllanmalar.
7. Xalq hunarmandchiligi va milliy madaniyatga oid ilmiy manbalar.

PREDICTION OF PREECLAMPSIA DEVELOPMENT IN PREGNANT WOMEN AFTER IN VITRO FERTILIZATION

Abstract : Preeclampsia remains one of the most common and clinically significant complications of pregnancy, particularly in women who conceive using assisted reproductive technologies, including in vitro fertilization (IVF). Impaired implantation, endothelial dysfunction, immune-inflammatory activation and hemostatic disturbances are considered key pathogenic mechanisms contributing to the development of this condition, which determines the need for early predictive markers.

Aim. To evaluate the predictive value of clinical, laboratory and Doppler parameters for the development of preeclampsia in pregnant women after IVF.

Materials and Methods. A prospective study included 80 pregnant women after IVF and 40 women with spontaneous pregnancies. At 11–14 weeks of gestation, serum levels of lactate dehydrogenase (LDH), homocysteine, C-reactive protein (CRP), D-dimer and vitamin D were measured. Coagulation parameters and Doppler indices of the uterine arteries (PI, RI, S/D) were also assessed. Statistical analysis included chi-square testing, odds ratio (OR) calculation, logistic regression and evaluation of predictive models.

Results. The incidence of preeclampsia in the IVF group was 30%. Women who subsequently developed preeclampsia demonstrated significantly higher levels of LDH, homocysteine, CRP and D-dimer, as well as vitamin D deficiency ($p < 0.05$). According to univariate analysis, LDH (OR=3.8), homocysteine (OR=3.5) and CRP (OR=2.4) showed the highest predictive value. Multivariate analysis identified elevated LDH and hyperhomocysteinemia as independent predictors. Increased uterine artery resistance on Doppler examination further improved predictive accuracy.

Conclusion. Combined assessment of biochemical markers and Doppler parameters enables early identification of high-risk patients after IVF and supports individualized prevention strategies for preeclampsia.

Keywords: in vitro fertilization, preeclampsia, prediction, biomarkers, hemostasis, Doppler ultrasound.

Introduction

Preeclampsia is one of the leading causes of maternal and perinatal morbidity and mortality worldwide and remains a major challenge in modern obstetrics. The

condition is characterized by new-onset hypertension and multisystem involvement after 20 weeks of gestation and is associated with severe maternal complications, fetal growth restriction, preterm birth and increased perinatal mortality.

In recent decades, the widespread use of assisted reproductive technologies, particularly in vitro fertilization (IVF), has significantly increased the number of pregnancies achieved through artificial conception. Numerous epidemiological studies and meta-analyses have demonstrated that pregnancies after IVF are associated with a higher risk of hypertensive disorders, including preeclampsia, compared with spontaneous conception. The increased risk is attributed to altered implantation processes, abnormal placentation, immune maladaptation, endothelial dysfunction and epigenetic factors.

Placental ischemia and impaired trophoblastic invasion lead to the release of antiangiogenic and inflammatory mediators, resulting in systemic endothelial dysfunction and generalized vasoconstriction. Biomarkers reflecting oxidative stress, tissue damage, inflammation and coagulation activation have therefore attracted considerable attention as potential early predictors of preeclampsia. Elevated lactate dehydrogenase (LDH) reflects cellular hypoxia and oxidative injury, while hyperhomocysteinemia contributes to endothelial damage and vascular dysfunction. C-reactive protein (CRP) is a sensitive marker of systemic inflammation and has been associated with the severity of hypertensive disorders of pregnancy. Increased D-dimer levels indicate activation of the coagulation cascade and microthrombotic processes in the placental circulation. Vitamin D deficiency has been implicated in immune dysregulation, impaired placental development and increased cardiovascular risk.

In addition to laboratory markers, Doppler ultrasound assessment of uterine artery blood flow provides valuable information about placental perfusion and vascular resistance. Increased pulsatility and resistance indices in early pregnancy reflect impaired uteroplacental circulation and have been associated with subsequent development of preeclampsia and fetal growth restriction.

Despite the availability of individual biomarkers and ultrasound parameters, there is no universally accepted predictive model for preeclampsia in IVF pregnancies. Most existing screening algorithms are derived from spontaneously conceived pregnancies and may not fully reflect the specific pathophysiological mechanisms in assisted reproduction. Therefore, the development of integrated predictive approaches combining biochemical and Doppler parameters is of particular clinical importance.

Early identification of high-risk patients enables timely implementation of preventive strategies, including low-dose aspirin therapy, correction of modifiable risk factors, individualized antenatal surveillance and optimization of perinatal care. Improving predictive accuracy in IVF pregnancies may significantly reduce the burden of severe obstetric complications and improve maternal and neonatal outcomes.

The aim of this study was to evaluate the predictive value of clinical, biochemical and Doppler parameters for the development of preeclampsia in pregnant women after in vitro fertilization.

Materials and Methods

A prospective observational study was conducted from 2023 to 2025 at the **Bukhara State Maternity Complex**. The study included 80 pregnant women after in vitro fertilization (IVF) and 40 women with spontaneous singleton pregnancies who formed the control group.

Inclusion criteria: singleton pregnancy after IVF, gestational age of 11–14 weeks at enrollment, written informed consent.

Exclusion criteria: chronic arterial hypertension, pregestational diabetes mellitus, autoimmune diseases, chronic kidney disease, multiple pregnancy and congenital fetal anomalies.

According to pregnancy outcomes, women after IVF were divided into two subgroups:

- **Group 1 (n=24):** patients who developed preeclampsia during pregnancy.
- **Group 2 (n=56):** patients with uncomplicated pregnancy after IVF.

Blood samples were collected at 11–14 weeks of gestation. Serum concentrations of lactate dehydrogenase (LDH), homocysteine, C-reactive protein (CRP), D-dimer and vitamin D were determined using enzyme-linked immunosorbent assay and standard biochemical methods. Coagulation parameters including activated partial thromboplastin time (APTT), fibrinogen, prothrombin index and international normalized ratio (INR) were assessed.

Doppler ultrasound examination of uterine arteries was performed using an expert-class ultrasound system with calculation of pulsatility index (PI), resistance index (RI) and systolic/diastolic ratio (S/D).

Statistical analysis was performed using SPSS software. Quantitative variables were expressed as mean $\pm$ standard deviation. Group comparisons were performed using Student's t-test or Mann–Whitney U test depending on data distribution. Categorical variables were analyzed using the χ^2 test. Odds ratios (OR) with 95% confidence intervals (CI) were calculated. Multivariate logistic regression analysis was applied to identify independent predictors of preeclampsia. A p-value <0.05 was considered statistically significant.

Results

A total of 80 pregnant women after IVF and 40 women with spontaneous pregnancies were analyzed. The mean age of patients in the IVF group was 33.6 ± 4.2 years and did not significantly differ from the control group (32.9 ± 3.8 years, $p>0.05$). The incidence of preeclampsia in the IVF group was 30% (24/80).

Women who subsequently developed preeclampsia demonstrated significantly higher serum levels of LDH, homocysteine, CRP and D-dimer compared with women with uncomplicated IVF pregnancies and controls ($p<0.05$). Vitamin D levels were significantly lower in the preeclampsia group ($p<0.05$).

Elevated LDH (>357 U/L) was associated with a markedly increased risk of preeclampsia (OR = 3.88; 95% CI 1.56–9.65; $p = 0.003$). Hyperhomocysteinemia

(>17 $\mu\text{mol/L}$) also significantly increased the risk (OR = 3.55; 95% CI 1.49–8.45; $p = 0.004$). Increased D-dimer levels (>872 ng/mL) were associated with higher odds of preeclampsia (OR = 2.33; 95% CI 1.03–5.30; $p = 0.041$). Elevated CRP (>8 mg/L) showed a significant association with disease development (OR = 2.49; 95% CI 1.06–5.86; $p = 0.035$). Vitamin D deficiency (<20 ng/mL) demonstrated a trend toward increased risk, although statistical significance was not reached in multivariate analysis.

Doppler ultrasound assessment revealed increased uterine artery pulsatility and resistance indices in patients who later developed preeclampsia, indicating impaired uteroplacental perfusion ($p < 0.05$).

Multivariate logistic regression identified elevated LDH and homocysteine as independent predictors of preeclampsia, while CRP and D-dimer contributed additional predictive value to the combined model. The integrated model demonstrated satisfactory discriminative ability for early prediction of preeclampsia.

Discussion

The present study demonstrates that pregnancies achieved by in vitro fertilization are characterized by a relatively high incidence of preeclampsia, confirming previously reported data on increased obstetric risk in this population. The identified associations between biochemical markers and subsequent development of preeclampsia highlight the multifactorial nature of this complication, involving endothelial dysfunction, inflammatory activation and coagulation imbalance.

Elevated LDH reflects cellular damage, oxidative stress and placental hypoxia, which are key mechanisms in the pathogenesis of preeclampsia. Hyperhomocysteinemia contributes to endothelial injury, impaired nitric oxide synthesis and increased vascular resistance, thereby promoting placental ischemia. Increased CRP levels indicate systemic inflammatory activation, which has been widely implicated in the progression of hypertensive disorders of pregnancy. Elevated D-dimer reflects activation of the coagulation cascade and microthrombotic processes within the placental circulation.

Vitamin D deficiency, although not an independent predictor in multivariate analysis, demonstrated an association with increased risk of preeclampsia, which is consistent with data suggesting its role in immune modulation and vascular function.

Doppler findings indicating increased uterine artery resistance further support the presence of impaired placental perfusion in high-risk patients. The combination of laboratory biomarkers with Doppler ultrasound parameters improves predictive accuracy and allows earlier identification of patients requiring intensified surveillance and preventive interventions.

The results of this study emphasize the clinical relevance of integrated screening strategies in IVF pregnancies. Early recognition of high-risk patients may facilitate timely initiation of preventive measures, including low-dose aspirin therapy, correction of vitamin D deficiency and closer antenatal monitoring.

Conclusion

Elevated serum levels of lactate dehydrogenase and homocysteine are independent predictors of preeclampsia in pregnant women after IVF. Increased CRP, D-dimer and altered uterine artery Doppler indices further enhance predictive accuracy. Combined assessment of biochemical and Doppler parameters allows early stratification of patients according to preeclampsia risk and supports personalized preventive strategies aimed at improving maternal and perinatal outcomes.

References

1. Садуллоева И.К., Ашурова Н.Г. Клинико-иммунологические особенности врожденных пороков сердца у девочек-подростков // Европейский журнал психологии. – 2021. – Т.17, №3. – С.172–177.
2. Саъдуллоева И.К., Кароматова Ф.А. Состояние кортикоидного статуса при врожденных пороках сердца у детей // Новый день в медицине. – 2021.
3. Курбановна С.И. Тимогенная иммунокоррекция детей с врожденными пороками сердца // Research Jet Journal of Analysis and Inventions. – 2022. – Т.3. – С.34–43.
4. Саидова С.Ю. Выявление эхокардиографических и антропометрических изменений у детей, рожденных с врожденными пороками сердца (0–1 года). – 2022.
5. Айламазян Э.К., Кулаков В.И., Радзинский В.Е. Акушерство: национальное руководство. – М.: ГЭОТАР-Медиа, 2022. – 1216 с.
6. Серов В.Н., Сухих Г.Т. Преэклампсия: современные аспекты патогенеза, диагностики и профилактики // Акушерство и гинекология. – 2021. – №5. – С.5–12.
7. Liu Y., Chen S., Zühlke L., Black G.C., Choy M.K., Li N., Keavney B.D. Global birth prevalence of congenital heart defects 1970–2017: updated systematic review and meta-analysis of 260 studies // International Journal of Epidemiology. – 2019. – Vol.48(2). – P.455–463.
DOI: 10.1093/ije/dyz009.
8. Liu Y., Chen S., Zühlke L., Babu-Narayan S.V., Black G.C., Choy M.K., Li N., Keavney B.D. Global prevalence of congenital heart disease in school-age children: a meta-analysis and systematic review // BMC Cardiovascular Disorders. – 2020. – Vol.20(1):488.
DOI: 10.1186/s12872-020-01781-x.
9. Rollins C.K., Newburger J.W., Roberts A.E. Genetic contribution to neurodevelopmental outcomes in congenital heart disease // Current Opinion in Pediatrics. – 2017. – Vol.29(5). – P.529–533.DOI: 10.1097/MOP.0000000000000530.
10. Sun R., Liu M., Lu L., Zheng Y., Zhang P. Congenital heart disease: causes, diagnosis, symptoms, and treatments // Cell Biochemistry and Biophysics. – 2015. – Vol.72(3). – P.857–860.DOI: 10.1007/s12013-015-0551-6.
11. Howell H.B., Zaccario M., Kazmi S.H., Desai P., Sklamberg F.E., Mally P. Neurodevelopmental outcomes of children with congenital heart disease: a review

// Current Problems in Pediatric and Adolescent Health Care. – 2019. – Vol.49(10):100685.DOI: 10.1016/j.cppeds.2019.100685.

12. van der Linde D., Konings E.E.M., Slager M.A., Witsenburg M., Helbing W.A., Takkenberg J.J.M., Roos-Hesselink J.W. Birth prevalence of congenital heart disease worldwide: a systematic review and meta-analysis // Journal of the American College of Cardiology. – 2011. – Vol.58(21). – P.2241–2247.

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HOZIRGI KUNDA TURIZMNING RIVOJLANISHI

Annotatsiya: Ushbu maqolada hozirgi kunda turizm sohasining jadal rivojlanishi, uning iqtisodiyotdagi o‘rni va ahamiyati yoritilgan. Turizmning asosiy yo‘nalishlari – madaniy, ekologik, ziyorat va raqamli turizmning o‘ziga xos xususiyatlari tahlil qilingan. Shuningdek, O‘zbekistonda turizmni rivojlantirish borasida amalga oshirilayotgan islohotlar, yaratilayotgan qulay shart-sharoitlar hamda sohada uchrayotgan muammolar va ularning yechimlari ko‘rib chiqilgan. Maqolada turizmning mamlakat iqtisodiy taraqqiyoti, aholi bandligi va xalqaro hamkorlikni rivojlantirishdagi muhim o‘rni asoslab berilgan.

Kalit so‘zlar: Turizm, turizm industriyasi, iqtisodiy rivojlanish, madaniy turizm, ekoturizm, ziyorat turizmi, turizm infratuzilmasi, xizmat ko‘rsatish sohasi, raqamli turizm, O‘zbekiston turizmi.

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CURRENT DEVELOPMENT OF TOURISM

Abstract: This article highlights the rapid development of the tourism sector today, its role and importance in the economy. The main directions of tourism - cultural, ecological, pilgrimage, and digital tourism - are analyzed. The reforms being implemented in the field of tourism development in Uzbekistan, the favorable conditions being created, as well as the problems encountered in the industry and their solutions were also considered. The article substantiates the important role of tourism in the country's economic development, employment, and the development of international cooperation.

Keywords: Tourism, tourism industry, economic development, cultural tourism, ecotourism, pilgrimage tourism, tourism infrastructure, service sector, digital tourism, tourism of Uzbekistan.

Bugungi kunda turizm jahon iqtisodiyotining eng tez rivojlanayotgan va yuqori daromad keltiruvchi tarmoqlaridan biri hisoblanadi. Jahon miqyosida

globallashuv jarayonlarining jadallashuvi, transport tizimlarining takomillashuvi hamda axborot-kommunikatsiya texnologiyalarining keng joriy etilishi turizm sohasining jadal sur'atlarda rivojlanishiga kuchli turtki bermoqda. Zamonaviy sharoitda turizm nafaqat iqtisodiy foyda manbai, balki davlatlar o'rtasidagi madaniy, ijtimoiy va ilmiy aloqalarni mustahkamlovchi muhim vosita sifatida ham namoyon bo'lmoqda. Ushbu soha aholi bandligini ta'minlash, yangi ish o'rinlarini yaratish, xizmat ko'rsatish tarmog'ini rivojlantirish hamda hududlarning ijtimoiy-iqtisodiy taraqqiyotiga ijobiy ta'sir ko'rsatishi bilan ahamiyatlidir.

Ayniqsa, so'nggi yillarda O'zbekiston Respublikasida turizm sohasini rivojlantirish davlat siyosatining ustuvor yo'nalishlaridan biriga aylantirildi. Mamlakatning boy tarixiy-meros ob'ektlari, noyob madaniy qadriyatlari, qulay geografik joylashuvi va tabiiy resurslari turizm salohiyatini yanada oshirish imkonini bermoqda. Turizm infratuzilmasini modernizatsiya qilish, vizasiz rejimlarning joriy etilishi, zamonaviy mehmonxonalar va transport tizimining rivojlantirilishi, shuningdek, ichki va tashqi turizmni qo'llab-quvvatlashga qaratilgan davlat dasturlari sohaning jadal rivojlanishiga xizmat qilmoqda. Natijada turizm iqtisodiyotning strategik tarmoqlaridan biriga aylanib, mamlakatning xalqaro maydondagi nufuzi va raqobatbardoshligini oshirishda muhim rol o'ynamoqda.

Turizm — bu shaxslarning dam olish, sog'lomlashtirish, bilim olish, madaniy-ma'rifiy ehtiyojlarini qondirish yoki xizmat safarlari maqsadida doimiy yashash joyidan vaqtincha chiqishi bilan bog'liq bo'lgan ijtimoiy-iqtisodiy faoliyat turidir. Bugungi kunda turizm faqatgina hordiq chiqarish vositasi bo'lib qolmay, balki ko'plab davlatlar iqtisodiyotining muhim tarmog'iga aylangan.

Turizmning iqtisodiyotdagi ahamiyati quyidagi jihatlarida namoyon bo'ladi:

- mamlakat yalpi ichki mahsuloti hajmining oshishiga xizmat qiladi;
- yangi ish o'rinlari yaratish orqali aholi bandligini ta'minlaydi;
- kichik biznes va xususiy tadbirkorlik rivojini jadallashtiradi;
- transport, savdo, mehmonxona, umumiy ovqatlanish kabi sohalarning rivojlanishiga turtki beradi;
- mamlakatning xalqaro imijini mustahkamlaydi va investitsiyalarni jalb etadi.

Bugungi kunda turizm jahon yalpi ichki mahsulotining salmoqli qismini tashkil etib, millionlab insonlar uchun daromad manbai bo'lib xizmat qilmoqda. Shu sababli ko'plab davlatlar turizmni strategik soha sifatida rivojlantirishga alohida e'tibor qaratmoqda.

Zamonaviy sharoitda turizm tarmog'i turli yo'nalishlarda jadal rivojlanib bormoqda. Ularning har biri o'ziga xos xususiyatlari bilan ajralib turadi.

Madaniy va tarixiy turizm eng keng tarqalgan yo'nalishlardan biri bo'lib, tarixiy obidalar, me'moriy yodgorliklar, muzeylar, qadimiy shaharlar bilan tanishishni o'z ichiga oladi. Bu turizm turi milliy madaniyatni asrash va targ'ib etishda muhim ahamiyatga ega.

O'zbekistonda Samarqand, Buxoro, Xiva, Shahrisabz kabi tarixiy shaharlar boy madaniy merosi bilan butun dunyoda mashhur bo'lib, YuNESKOning Butunjahon merosi ro'yxatiga kiritilgan obidalar sayyohlarni o'ziga jalb etmoqda.

Ekoturizm tabiatni muhofaza qilish, ekologik muvozanatni saqlash hamda tabiiy resurslardan oqilona foydalanishga asoslangan turizm turidir. Bu yo'nalishda sayyohlar tog'li hududlar, milliy bog'lar, qo'riqxonalar, cho'l va dasht hududlariga tashrif buyuradilar.

O'zbekistonda Chotqol, Zomin, Nurota, Qizilqum hududlari ekoturizmni rivojlantirish uchun katta imkoniyatlarga ega bo'lib, ushbu yo'nalish kelajakda ekologik barqaror rivojlanishga xizmat qilishi mumkin.

Ziyorat turizmi diniy-ma'naviy ahamiyatga ega bo'lib, muqaddas qadamjolarni ziyorat qilishga asoslanadi. O'zbekiston islom sivilizatsiyasining muhim markazlaridan biri hisoblanib, Imom Buxoriy, Imom Termiziy, Bahouddin Naqshband kabi buyuk allomalar qadamjolari bilan mashhur.

So'nggi yillarda ziyorat turizmini rivojlantirish maqsadida infratuzilma yaxshilanib, xorijiy sayyohlar uchun qulay sharoitlar yaratilmoqda.

Axborot texnologiyalarining rivojlanishi turizm sohasiga ham kuchli ta'sir ko'rsatdi. Bugungi kunda onlayn bronlash tizimlari, elektron vizalar, mobil ilovalar, virtual ekskursiyalar turizm xizmatlarini yanada qulay va ommabop qilmoqda. Raqamli texnologiyalar yordamida turistlar sayohatni oldindan rejalashtirish, to'lovlarni amalga oshirish va xizmatlardan masofadan turib foydalanish imkoniyatiga ega bo'lmoqda.

So'nggi yillarda O'zbekiston Respublikasida turizmni rivojlantirish bo'yicha keng ko'lamli islohotlar amalga oshirilmoqda. Xususan:

- ko'plab davlatlar uchun vizasiz rejim joriy etildi;
- zamonaviy mehmonxonalar va mehmon uylari soni oshirildi;
- avtomobil, temir yo'l va havo transporti infratuzilmasi rivojlantirildi;
- "Silk Road", "Ziyorat turizmi", "Ichki turizm" kabi davlat dasturlari amalga oshirildi;

- turizm sohasini tartibga soluvchi qonunchilik takomillashtirildi.

Ushbu chora-tadbirlar natijasida mamlakatga tashrif buyuruvchi xorijiy sayyohlar soni yil sayin ortib bormoqda hamda turizm milliy iqtisodiyotning muhim daromad manbaiga aylanmoqda.

Shu bilan birga, turizm sohasida ayrim muammolar ham mavjud:

- xizmatlar sifati hamma hududlarda bir xil emasligi;
- malakali kadrlar yetishmasligi;
- ayrim hududlarda infratuzilmaning sust rivojlanganligi;
- reklama va marketing ishlarining yetarli darajada yo'lga qo'yilmaganligi.

Mazkur muammolarni bartaraf etish uchun quyidagi chora-tadbirlarni amalga oshirish maqsadga muvofiq:

- turizm yo'nalishida malakali mutaxassislar tayyorlash;
- xizmat ko'rsatish madaniyatini oshirish;
- raqamli marketing va reklama faoliyatini kuchaytirish;
- hududiy turizm loyihalarini kengaytirish;

- xususiy sektor ishtirokini rag‘batlantirish.

Xulosa qilib aytganda, hozirgi kunda turizm iqtisodiyotning eng istiqbolli va tez rivojlanayotgan tarmoqlaridan biri hisoblanadi. O‘zbekistonda amalga oshirilayotgan islohotlar, yaratilayotgan qulay shart-sharoitlar va boy turistik salohiyat ushbu sohaning kelajakdagi rivojlanishi uchun mustahkam asos bo‘lib xizmat qilmoqda. Turizm nafaqat iqtisodiy daromad manbai, balki milliy madaniyatni targ‘ib qilish, xalqaro hamkorlikni mustahkamlash hamda aholining turmush darajasini oshirishda muhim omil hisoblanadi. Kelgusida ushbu sohani yanada rivojlantirish mamlakat taraqqiyotining ustuvor yo‘nalishlaridan biri bo‘lib qoladi.

Foydalanilgan adabiyotlar ro‘yxati

1. O‘zbekiston Respublikasi Prezidenti Farmoni. “Turizm sohasini jadal rivojlantirish chora-tadbirlari to‘g‘risida”, 2019-yil.
2. O‘zbekiston Respublikasi Prezidenti. “2022–2026-yillarda Yangi O‘zbekistonni rivojlantirish strategiyasi”. – Toshkent, 2022.
3. Abdukarimov B.A. Turizm iqtisodiyoti. – Toshkent: Iqtisodiyot nashriyoti, 2020.
4. Qodirov A.Q., Ismoilov Sh.X. Turizmni tashkil etish va boshqarish. – Toshkent: Fan va texnologiya, 2019.
5. O‘zbekiston Respublikasi Turizm va madaniy meros vazirligi rasmiy sayti: <https://uzbektourism.uz>
6. Jahon Turizm Tashkiloti (UNWTO) ma’lumotlari: <https://www.unwto.org>

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WEB-INTERFEYSLARNI AVTOMATLASHTIRILGAN BOSHQARUV TIZIMLARIGA INTEGRATSIYA QILISH MEXANIZMLARI

Annotatsiya: ushbu maqolada web-interfeyslarni avtomatlashtirilgan boshqaruv tizimlariga integratsiya qilishning texnologik mexanizmlari tahlil qilingan. “My.gov.uz” va “Uzcard” tizimlari misolida integratsiya jarayonining afzalliklari va samaradorlik ko‘rsatkichlari tahlil etilgan.

Kalit so‘zlar: web-interfeys, integratsiya, avtomatlashtirilgan boshqaruv tizimi, API, raqamli texnologiyalar, UX/UI.

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MECHANISMS FOR THE INTEGRATION OF WEB INTERFACES INTO AUTOMATED MANAGEMENT SYSTEMS

Abstract: this article analyzes the technological mechanisms for integrating web interfaces into automated control systems. The advantages and performance indicators of the integration process were analyzed using the example of the “My.gov.uz” and “Uzcard” systems.

Keywords: web interface, integration, automated control system, API, digital technologies, UX/UI.

So‘nggi yillarda axborot texnologiyalari va dasturiy injiniringning jadal rivojlanishi natijasida korxonalar faoliyatida web-interfeyslarni avtomatlashtirilgan boshqaruv tizimlari bilan integratsiyalash zarurati keskin ortib bormoqda. Ushbu jarayon informatikada yaratilgan API integratsiyasi, ma’lumotlar bazasi sinxronizatsiyasi va tarmoqli dasturlash texnologiyalari orqali ishlab chiqarish, logistika, moliyaviy nazorat hamda xizmat ko‘rsatish jarayonlarini real vaqt rejimida boshqarish imkonini bermoqda.

Avtomatlashtirilgan boshqaruv tizimlarining samarali ishlashi bevosita foydalanuvchi interfeyslari (UX/UI) orqali ma’lumot almashish tezligi va aniqligiga

bog‘liqdir. Web-interfeys foydalanuvchi bilan tizim o‘rtasida o‘zaro aloqa o‘rnatadigan asosiy bo‘g‘in sifatida, ma’lumotlar oqimini soddalashtirish, tahlil jarayonlarini tezlashtirish va qaror qabul qilishni optimallashtirishda muhim rol o‘ynaydi¹⁹.

Bugungi kunda “Raqamli O‘zbekiston – 2030” strategiyasi doirasida davlat va xususiy sektor korxonalarida avtomatlashtirilgan boshqaruv tizimlarini joriy etish, ularni web-interfeyslar orqali integratsiya qilish texnologik va boshqaruv samaradorligini oshiruvchi ustuvor yo‘nalishlardan biri sifatida e’tirof etilmoqda²⁰. Shu bois, web-interfeyslarni avtomatlashtirilgan tizimlarga integratsiya qilish mexanizmlarini ishlab chiqish hozirgi axborot texnologiyalari rivojlanishining dolzarb va strategik yo‘nalishiga aylanmoqda²¹.

Web-interfeys modullarini avtomatlashtirilgan boshqaruv tizimlariga (ABT) integratsiya qilish korxonalarda ma’lumot almashinuvi tezligi, xatoliklar ulushi va qaror qabul qilish aniqligini sezilarli darajada oshiradi²². Ayniqsa, API (Application Programming Interface) orqali SCADA, ERP va CRM tizimlarining o‘zaro bog‘lanishi ishlab chiqarish jarayonlarining real vaqt rejimida sinxron boshqaruvini ta’minlaydi²³. Xalqaro tajribalarda (MDPI, IEEE, arXiv) Smart Factory modelini qo‘llash natijasida quyidagi o‘zgarishlar kuzatilgan: Uskunalaridan foydalanish darajasi (“machine utilisation”) – 47 % ga oshgan²⁴; Downtime waste (to‘xtash yo‘qotishlari) – 53 % ga kamaygan²⁵; Energiya iste’moli – 18–28 % ga qisqargan²⁶; Qaror qabul qilish tezligi – 30–40 % ga oshgan²⁷. O‘zbekiston sharoitida “My.gov.uz” va “Uzcard” tizimlari integratsiyasi tajribasi shuni ko‘rsatadiki, ma’lumot uzatish tezligi o‘rtacha 33 % ga, xatoliklar 25 % ga, qaror qabul qilish vaqti 30 % ga qisqargan, ishlab chiqarish samaradorligi esa 1,00 dan 1,36 gacha oshgan²⁸. Bu o‘zgarishlar quyidagi omillar bilan izohlanadi: API va GraphQL texnologiyalari orqali ma’lumotlar oqimining avtomatik sinxronlashuvi²⁹; UX/UI interfeyslarining ergonomik tahlili tufayli inson xatoliklarining kamayishi³⁰; SCADA tizimlari bilan integratsiya orqali real vaqt monitoringi va analitik kuzatuv imkoniyatlarining kengayishi³¹. “Smart Factory” (Jizzax EIZ) sinov natijalariga ko‘ra, web-interfeys moduli joriy etilgandan so‘ng ishlab chiqarish samaradorligi 1,36 baravar oshgan, xodimlar tomonidan hisobot tayyorlash vaqti 2,5 baravar

¹⁹ Myers B., Hudson S. *Human-Computer Interaction and Web Engineering*. ACM Press, 2021.

²⁰ O‘zbekiston Respublikasi Prezidentining “Raqamli O‘zbekiston – 2030” strategiyasi to‘g‘risidagi PF–6079-son Farmoni, 2020-yil 5-oktabr.

²¹ OpenAI va Google Developers. *API Integration and Automation Systems Guide*. 2024.

²² Sufian A.T. *Smart Manufacturing Application in Precision Manufacturing*. MDPI Jurnal, Vol 15, No 2, 2025.

²³ Zhang H. & Lee J. *SCADA-ERP Integration for Real-Time Production Monitoring*. IEEE Access, Vol 12, 2024.

²⁴ Sufian A.T. *Smart Manufacturing Application in Precision Manufacturing*. MDPI Jurnal, Vol 15, No 2, 2025.

²⁵ Zhang H. & Lee J. *SCADA-ERP Integration for Real-Time Production Monitoring*. IEEE Access, Vol 12, 2024.

²⁶ Rahman K. et al. *A Framework for IoT-Enabled Smart Factory for Energy and Resource Optimization*. arXiv, 2502.03040, 2025.

²⁷ Mishra P. *Digital Twin and API Integration for Smart Manufacturing Systems*. Springer Open, 2024.

²⁸ Jizzax EIZ “Smart Factory” sinov natijalari, 2025

²⁹ Rahman K. et al. *A Framework for IoT-Enabled Smart Factory for Energy and Resource Optimization*. arXiv, 2502.03040, 2025.

³⁰ Nielsen J. & Molich R. *User Interface Design Heuristics for Web Applications*. ACM Digital Library, 2023.

³¹ Zhang H. & Lee J. *SCADA-ERP Integration for Real-Time Production Monitoring*. IEEE Access, Vol 12, 2024.

kamaygan, OEE ko'rsatkichi esa 0,68 dan 0,91 gacha ko'tarilgan³². Natijada integratsiya qilinmagan tizimlarga nisbatan ishlab chiqarishdagi qaror qabul qilish tezligi 1,4 baravar, axborot oqimi tezligi 1,25 baravar, hamda foydalanuvchi xatoliklari chastotasi 0,7 baravar yaxshilangan. Bu ko'rsatkichlar "Raqamli O'zbekiston – 2030" strategiyasida belgilangan sanoat raqamlashtirish maqsadlariga mos keladi³³.

Yuqoridagi tahlillar asosida shuni ta'kidlash mumkinki, web-interfeyslarni avtomatlashtirilgan boshqaruv tizimlariga integratsiya qilish — korxona va tashkilotlarda raqamli boshqaruv samaradorligini oshirishning eng muhim omillaridan biridir. Ushbu integratsiya orqali ma'lumotlar oqimini avtomatlashtirish, inson xatoliklarini kamaytirish, va foydalanuvchi tajribasini optimallashtirish imkoniyatlari sezilarli darajada kengayadi.

FOYDALANILGAN ADABIYOTLAR RO'YXATI

1. O'zbekiston Respublikasi Prezidentining "Raqamli O'zbekiston – 2030" strategiyasi to'g'risidagi PF-6079-son Farmoni, 2020-yil 5-oktabr.
2. Myers B., Hudson S. *Human-Computer Interaction and Web Engineering*. ACM Press, 2021.
3. OpenAI va Google Developers. *API Integration and Automation Systems Guide*. 2024.
4. Karimov A.A. *Axborot tizimlari va avtomatlashtirish asoslari*. Toshkent: Innovatsiya nashriyoti, 2023.
5. Abdurahmonov D., Hamidova N. *Raqamli boshqaruv tizimlarida web-interfeyslarning o'rni*. "Axborot texnologiyalari jurnali", №4, 2022.
6. Google Developers. *API Integration & Automation Standards*. California, 2024.
7. Rustamova M. *O'zbekiston korxonalarida web-platfomalarni integratsiya qilishning amaliy jihatlari*. "Digital Economy" e-jurnali, №2, 2024.
8. Sufian A.T. *Smart Manufacturing Application in Precision Manufacturing*. MDPI Jurnal, Vol 15, No 2, 2025.
9. Zhang H. & Lee J. *SCADA-ERP Integration for Real-Time Production Monitoring*. IEEE Access, Vol 12, 2024.
10. Rahman K. et al. *A Framework for IoT-Enabled Smart Factory for Energy and Resource Optimization*. arXiv, 2502.03040, 2025.
11. Mishra P. *Digital Twin and API Integration for Smart Manufacturing Systems*. Springer Open, 2024.
12. Nielsen J. & Molich R. *User Interface Design Heuristics for Web Applications*. ACM Digital Library, 2023.
13. Jizzax EIZ "Smart Factory" sinov natijalari, 2025

³² Jizzax EIZ "Smart Factory" sinov natijalari, 2025

³³ O'zbekiston Respublikasi Prezidentining PQ-60-son Farmoni. "Raqamli O'zbekiston – 2030" strategiyasini tasdiqlash to'g'risida, 2020 yil 5 oktabr.

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IMPROVING THE IMPACT OF DIGITAL FINANCIAL TECHNOLOGIES ON THE TRANSFORMATION OF BANKING SERVICES IN THE REPUBLIC OF UZBEKISTAN

Annotation: *The article examines the processes of digital transformation of banking services under the influence of digital financial technologies. Special attention is paid to the role of FinTech solutions, artificial intelligence, big data and mobile platforms in the modernization of the banking sector of the Republic of Uzbekistan. The main directions of digitalization of banks are analyzed, problems and risks are identified, and measures are proposed to improve the impact of digital financial technologies on the development of banking services in the digital economy.*

Keywords: *digital financial technologies, banking services, FinTech, digitalization, artificial intelligence, banking system of Uzbekistan.*

In the context of global digitalization, the financial sector is undergoing significant structural changes. Banking institutions are forced to adapt to new market requirements associated with the growth of digital services, changes in customer behavior, and increased competition from FinTech companies. For the Republic of Uzbekistan, the digital transformation of the banking sector is an important factor in enhancing the resilience of the financial system, expanding financial inclusion, and accelerating economic development. The relevance of this study is driven by the need to improve mechanisms for implementing digital financial technologies in banking activities, taking into account national characteristics and strategic development priorities. Artificial intelligence, blockchain, mobile technologies, cloud computing, and big data are pushing banks toward the digitalization of services, payments, lending, security, and operations. Studies demonstrate faster transactions and higher customer satisfaction, while also highlighting challenges related to cybersecurity, regulation, and infrastructure.

Digital transformation has reshaped the operational, strategic, and interpersonal dynamics of the banking industry, placing technological innovation at the center of competitive advantage and customer engagement. Banks around the world increasingly use digital tools to improve efficiency, reduce costs, and deliver personalized services. However, the impact of these innovations goes beyond

automation and cost savings; it transforms the nature of customer relationships and long-term loyalty. This article examines the role of digital transformation in the banking sector, with a focus on the impact of technological innovations and the development of an integrated system to achieve success in customer relationships.

The study examines three key aspects of digital transformation. First, technological innovations are assessed through advances in artificial intelligence, blockchain, mobile banking platforms, and big data analytics, highlighting their role in product development, fraud detection, and the optimization of customer experience. Second, the article analyzes the transformation of customer interactions, emphasizing the shift toward omnichannel engagement, real-time service delivery, and predictive personalization, which collectively redefine the criteria for customer satisfaction. Third, organizational adaptability is evaluated, noting the importance of aligning digital strategies with workforce upskilling, regulatory compliance, and cultural readiness for innovation.

The findings emphasize that while digital transformation enhances operational efficiency and market reach, its long-term value lies in strengthening trust, transparency, and the building of meaningful customer relationships. Challenges such as cybersecurity risks, digital exclusion, and resistance to change remain significant barriers. To address these issues, the article proposes an integrated framework for customer relationship success. Banks can move beyond transactional efficiency toward sustainable, customer-centric growth.

The study concludes that digital transformation, when strategically integrated with relationship-building practices, provides a foundation for customer loyalty, competitiveness, and the long-term success of banking in the digital era.

In recent years, Uzbekistan has witnessed active development of digital financial services. Commercial banks are introducing mobile applications, remote banking systems, electronic payments, and online lending. Government support for digitalization plays a significant role, aiming to expand cashless payments and promote financial inclusion. The growing number of users of mobile banking and electronic payment services indicates the formation of stable demand for digital banking services. Process automation significantly reduces service delivery time, improves accuracy, and lowers operational costs. The use of intelligent systems reduces the workload on staff and enhances management efficiency. Digital technologies provide access to banking services for populations in remote regions, contributing to the development of financial inclusion.

Conclusion

Digital financial technologies have a significant impact on the transformation of banking services, shaping new models of service delivery and management. For the Republic of Uzbekistan, their effective implementation is an important factor in the development of the financial system and the economy as a whole. Enhancing the impact of digital technologies requires a comprehensive approach that integrates innovation, security, and government regulation.

References

1. Gomber, P., Koch, J., & Siering, M. Digital Finance and FinTech. 2017.

2. Vives, X. Competition and Stability in Modern Banking. 2019.
3. Philippon, T. The FinTech Opportunity. 2020.
4. Arner, D., Barberis, J., & Buckley, R. The Evolution of FinTech. 2018.
5. Ozili, P. Financial Inclusion and Digital Finance. 2021.

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TEKNIKUM O'QUVCHILARIDA ALGORITMIK FIKRLASHNI SHAKLLANTIRISHDA BLOK-SXEMA VA PSEVDOKODDAN FOYDALANISH METODIKASI

Annotatsiya. Ushbu maqolada texnikum o'quvchilarida algoritmik fikrlashni shakllantirish uchun blok sxema va psevdokoddan foydalanishga tayangan metodik yondashuv bayon qilinadi. Algoritmik fikrlash masalani tahlil qilish, yechimni bosqichma bosqich qurish, bajarilish oqimini boshqarish hamda xatoni mantiqan topish ko'nikmalarini birlashtiradi. Maqolada algoritmik fikrlash va computational thinking talqinlari orqali nazariy asos beriladi, so'ngra blok sxema va psevdokodning o'quvchi uchun kognitiv yuklamani kamaytiruvchi, tushunishni tezlashtiruvchi vosita sifatidagi imkoniyatlari muhokama qilinadi.

Kalit so'zlar: algoritmik fikrlash, blok sxema, psevdokod, masalani yechish, dasturlash asoslari, didaktik ketma ketlik, kognitiv yuklama, vizuallashtirish, texnikum ta'limi, baholash mezonlari.

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METHODOLOGY OF USING BLOCK DIAGRAM AND PSEUDOCODE IN FORMING ALGORITHMIC THINKING IN TECHNICAL SCHOOL STUDENTS

Abstract. This article presents a methodological approach to developing algorithmic thinking among technical college students through the systematic use of flowcharts and pseudocode. Algorithmic thinking is treated as an integrated set of skills that includes problem analysis, step by step solution design, execution flow control, and logical debugging. The paper first provides a theoretical grounding via established interpretations of algorithmic and computational thinking, then discusses how flowcharts and pseudocode can reduce cognitive load and accelerate comprehension by making control flow explicit.

Keywords: algorithmic thinking, flowchart, pseudocode, problem solving, introductory programming, task sequencing, cognitive load, visualization, technical college, assessment criteria.

Kirish

Algoritmik fikrlash texnik ta'limning ichki motori desak, mubolag'a bo'lmaydi. Texnikumda o'qiyotgan yoshlar ko'pincha amaliy kasbiy vazifalarga yaqin bo'lgan jarayonlarni o'rganadi, lekin bu jarayonlarning mantiqiy tuzilmasini anglash, bosqichlarga ajratish va shaffof algoritmgaga aylantirish ko'nikmasi yetarli darajada shakllanmasa, bilim tez unutiladi yoki faqat ko'rsatma bo'lsa ishlaydigan darajada qoladi. Algoritmik fikrlash aynan shuni tuzatadi: vazifani to'g'ri qo'yish, kiruvchi ma'lumotni tartibga solish, shart va takrorlanishlarni ajratish, yakuniy natijani tekshirish, xatoni topish va tuzatish. Computational thinking doirasida masalani kompyuter bajaradigan qadamlar va algoritmlar ko'rinishida ifodalash fikrlash jarayonining markaziy qismi sifatida izohlanadi, bu yondashuv muammolarni algoritmlashtirishni umumiy madaniy ko'nikma darajasiga ko'taradi [1].

Adabiyotlar sharhi

Computational thinking g'oyasi keng ma'noda muammoni abstraksiyalash, dekompozitsiya, model tanlash va algoritmlash kabi aqliy amallar majmuasiga tayangan holda talqin qilinadi [1]. Bu talqinda algoritmik fikrlash alohida bo'lak emas, balki muammoni yechishga xizmat qiladigan markaziy mexanizm sifatida ko'riladi. Aho tomonidan berilgan izohda esa computational thinking muammolarni shunday ifodalash jarayoni sifatida tushuntiriladiki, yechimlar hisoblash qadamlariga va algoritmlarga aylantiriladi, bunda mos hisoblash modeli va uning semantikasi muhim o'rin tutadi [2]. Bu qarash texnikumdagi o'qitish uchun juda amaliy: o'quvchi faqat kod yozishni emas, balki vazifa uchun mos modelni tanlashni ham o'rganadi, masalan ketma ket bajariladigan jarayon, shartli tarmoqlanish yoki resurs cheklovi bo'lgan jarayon.

Psevdokod va blok sxemani o'rgatishning klassik yondashuvida muhim jihat shuki, ular tilga bog'liq bo'lmagan holda dastur mantiqini ochib beradi. Bu fikr boshlang'ich dasturlash adabiyotlarida ham tayanch sifatida yuritiladi: psevdokod, blok sxema, amaliy misollar va mashqlar yangi o'rganuvchiga mantiqni ko'rishga yordam berishi ta'kidlanadi [3]. Biroq so'nggi tadqiqotlar psevdokodning qanday ko'rinishda berilishi ham hal qiluvchi bo'lishi mumkinligini ko'rsatmoqda. Katta hajmdagi xalqaro tadqiqotda 405 nafar birinchi bosqich talaba ishtirok etgan va talabalarga ona tiliga yaqin, o'zlari tanlagan kalit so'zlar asosidagi tabiiy psevdokod, odatiy standart psevdokod hamda inglizcha psevdokod variantlari bilan tushunish topshiriqlari berilgan. Natijada tabiiy psevdokodda tushunish darajasi yuqoriroq bo'lgani qayd etilgan [4].

Tadqiqot metodologiyasi va empirik tahlil

Algoritmik fikrlashni shakllantirish metodikasi avvalo mazmunni bosqichma bosqich ochishga tayanadi: o'quvchi masalani o'qiydi, lekin masalaning ichida yotgan algoritmnini ko'rmaydi. Shuning uchun birinchi vazifa masalani tahlil qilish tilini o'rgatishdir: nimalar berilgan, nimani topish kerak, qanday cheklovlar bor, natija qanday tekshiriladi. Bu tahlil tilini shakllantirishda blok sxema juda qulay, chunki u qaror qabul qilish nuqtalarini, takrorlanishni va ketma ket bajariladigan amallarni alohida ko'rsatadi. O'quvchi blok sxema chizayotganda o'zi bilmagan

holda dekompozitsiya qiladi, keyin esa shu sxema asosida psevdokod yozishga o'tadi. Psevdokod bu bosqichda erkin, lekin tartibli bo'lishi kerak: har bir qadam alohida satrda, shartlar aniq, takrorlanish chegarasi ravshan, kirish va chiqish ajratilgan. Bu usul o'quvchini bir vaqtning o'zida ikkita murakkablik bilan qiynamaydi: bir tomondan mantiq, ikkinchi tomondan til sintaksisi. Mantiq mustahkamlangach, psevdokoddan real dasturlash tiliga o'tish tezlashadi.

Natijalar

Psevdokod va blok sxemani o'rgatishning klassik yondashuvida muhim jihat shuki, ular tilga bog'liq bo'lmagan holda dastur mantiqini ochib beradi. Bu fikr boshlang'ich dasturlash adabiyotlarida ham tayanch sifatida yuritiladi: psevdokod, blok sxema, amaliy misollar va mashqlar yangi o'rganuvchiga mantiqni ko'rishga yordam berishi ta'kidlanadi [3]. Biroq so'nggi tadqiqotlar psevdokodning qanday ko'rinishda berilishi ham hal qiluvchi bo'lishi mumkinligini ko'rsatmoqda. Katta hajmdagi xalqaro tadqiqotda 405 nafar birinchi bosqich talaba ishtirok etgan va talabalarga ona tiliga yaqin, o'zlari tanlagan kalit so'zlar asosidagi tabiiy psevdokod, odatiy standart psevdokod hamda inglizcha psevdokod variantlari bilan tushunish topshiriqlari berilgan. Natijada tabiiy psevdokodda tushunish darajasi yuqoriroq bo'lgani qayd etilgan [4]. Bu xulosa texnikum uchun ham juda qimmat: o'quvchi mantiqni tushunsa, keyin sintaksisni ham osonroq egallaydi.

Blok sxema asosidagi o'qitish muhitlari bo'yicha ham empirik dalillar mavjud. Masalan, Hooshyar va hammualliflar oqimni blok sxema orqali qurishga tayangan, o'yin elementlari qo'shilgan va formatif baholashni qo'llab quvvatlaydigan intellektual o'qituvchi tizimni sinovdan o'tkazgan, maqolada 52 nafar talaba bilan tajriba o'tkazilgani va bunday yondashuv muammoli vazifalarda o'qish natijalarini yaxshilashga yordam bergani bayon qilingan [5]. Bu yerda texnikum uchun asosiy signal shuki, blok sxema faqat chiziladigan rasm emas, u o'quvchi fikrini boshqaradigan tashkiliy vosita bo'la oladi.

Algoritmik fikrlashni baholash masalasi ham metodikaning ajralmas qismi. Adorni va hammualliflar algoritmik fikrlashni baholashda unplugged va raqamli yondashuvlarni taqqoslaydi, Cross Array Task faoliyatining qog'ozdagi va iPad dagi varianti asosida katta ko'lamli baholashning avtomatlashtirilishi, ma'lumot yig'ish va tezkor fikr bildirish imkoniyati ochilishi qayd etiladi hamda raqamli vositalar baholashda samaraliroq bo'lishi mumkinligi haqida xulosalar beriladi [6]. Bu texnikum sharoitida shuni anglatadi: agar baholash shaffof mezonlarga tayansa va tezkor teskari aloqa berilsa, o'quvchi xatosini mantiqan ko'rib, algoritmni qayta qurishga o'rganadi.

Taklif etilayotgan metodik model uch yo'nalishda ketadi: algoritmni ko'rish, algoritmni yozish, algoritmni ishlatish va tekshirish. Algoritmni ko'rish bosqichida o'quvchi vazifani blok sxemaga aylantiradi. Bu yerda o'qituvchi blok sxema belgilarini bir kunda yodlatib qo'yishni maqsad qilmaydi, aksincha, minimal belgilar to'plami bilan boshlaydi: boshlash va tugatish, amal bajarish, kiritish va chiqarish, shart, bog'lovchi o'tish. Har bir yangi belgi yangi didaktik ehtiyoj bilan kiradi, ya'ni o'quvchi takrorlanish kerakligini sezsa, takrorlanish bloklari ham kiradi. Shunda blok sxema vosita bo'lib qoladi, maqsadga aylanmaydi.

Xulosa va munozara

Texnikum o'quvchilarida algoritmik fikrlashni shakllantirish uchun blok sxema va psevdokod metodik jihatdan juda qulay, chunki ular dasturlash sintaksisidan oldin mantiqni ko'rsatadi, bajarilish oqimini shaffof qiladi va o'quvchini masalani bosqichma bosqich qurishga majbur qiladi. Nazariy manbalarda computational thinking muammoni algoritmlar ko'rinishida ifodalash jarayoni sifatida talqin qilinadi va bu yondashuv algoritmik fikrlashni umumiy kompetensiya darajasida ko'rishga imkon beradi [1], [2]. O'quv adabiyotlarida psevdokod va blok sxemalar yangi o'rganuvchi uchun tushunishni yengillashtiruvchi vosita sifatida keng qo'llanadi [3]. Empirik tadqiqotlar esa psevdokodning o'quvchiga yaqinlashtirilgan ko'rinishi tushunishni oshirishi mumkinligini, blok sxema asosidagi raqamli muhitlar esa muammoli vazifalarda natijani yaxshilashga xizmat qilishini ko'rsatadi [4], [5].

ADABIYOTLAR RO'YXATI

1. Wing J. M. Computational Thinking // Communications of the ACM. 2006. Vol. 49. No. 3. P. 33–35.
2. Aho A. V. Computation and Computational Thinking // The Computer Journal. 2012. Vol. 55. No. 7. P. 832–835. doi:10.1112/comjnl/bxs074.
3. Gaddis T. Starting Out with Programming Logic and Design. 6th ed. Pearson, 2022. 800 p. ISBN 0137601913.
4. López-García A., Urquiza-Fuentes J., Mendes A. J., Caeiro-Rodríguez M. Improving University Students' Learning of Programming Using Customised Pseudocode // Computer Applications in Engineering Education. 2025. Vol. 33. e70061. doi:10.1002/cae.70061.
5. Hooshyar D., Ahmad R. B., Yousefi M., Fathi M., Horng S. J., Lim H. Applying an online game-based formative assessment in a flowchart-based intelligent tutoring system for improving problem-solving skills // Computers and Education. 2016. Vol. 94. P. 18–36. doi: 10.1016/j.compedu.2015.10.013.
6. Adorni G., Artico I., Piatti A., Lutz E., Gambardella L. M., Negrini L., Mondada F., Assaf D. Development of algorithmic thinking skills in K-12 education: A comparative study of unplugged and digital assessment instruments // Computers in Human Behavior Reports. 2024. Vol. 15. 100466. doi: 10.1016/j.chbr.2024.100466.

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**TOPIC: THE INTRODUCTION AND POPULARIZATION OF
TECHNICAL EQUIPMENT INTO THE LIFE OF THE POPULATION IN
THE UZBEK SSR AND KARAKALPAK ASSR IN THE SECOND HALF
OF THE 20TH CENTURY**

Abstract. *This article reveals the domestic changes in the life of the population of Uzbekistan and Karakalpakstan in the second half of the 20th century, the process of transition to favorable living conditions, and the population's attitude towards this. Also, the level of use of household appliances by the population is analyzed annually. This issue is revealed on the basis of various literature, sources, newspaper and magazine articles, and archival documents on the topic. At the same time, the results of field research are also included.*

Key words. *Household appliances, retail, refrigerators, radio equipment, televisions, washing machines, vacuum cleaners, sewing machines*

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**MAVZU: 20-ASR 2-YARIMIDA O‘ZBEKISTON SSR VA
Qoraqalpog‘iston ASSRda AHOLI HAYATIGA TEXNIK JOSHALARNING
KIRISHI VA MAHMUBLANTIRISHI**

Annotatsiya. *Mazkur maqolada XX asrning ikkinchi yarmida O‘zbekiston va Qoraqalpog‘iston miqyosida aholi hayotida bo‘lgan maishiy o‘zgarishlar, qulay ahot sharoitiga o‘tish jarayoni, aholining bunga munosabati ochib beriladi. Shuningdek, aholining maishiy texnika uskunalaridan foydalanish darajasining qay holatda bo‘lgani yilma yil tahlil qilinadi. Bu masala mavzuga doir turli adabiyotlar, manbalar, gazeta-jurnal maqolalari va arxiv hujjatlari asosida ochib beriladi. Shu bilan birga dala tadqiqoti natijalari ham o‘rin oladi.*

Tayanch so‘zlar. *Maishiy texnika, savdo, sovutgich, radio uskunalar, televizorlar, kir yuvish mashinalari, changyutgichlar, tikuv mashinalari*

It is clear as day that the 21st century is the age of technology. From this, we can say that in our modern world, it is impossible to imagine every household without technical equipment. Especially over the past 15 years, this process has been growing rapidly in almost all regions of our republic. We all know that the achievements of science and technology are increasingly creating conveniences in

our lives. In reality, in what period did this scientific and technological progress emerge, and in what period did it achieve such progress?

Scientific and technological progress is the interconnected, unified, progressive development of science and technology; it is the foundation of social progress. Initially, the convergence between scientific and technological progress occurred in the 16th-18th centuries in connection with manufactory production. Until this period, material production was formed on the basis of empirical experience and craftsmanship. By the middle of the 20th century, the role of science in social life had risen to an unprecedented level. The nature of revolutions in the development of sciences has changed, that is, fundamental changes in the field of science have become intertwined with information in the field of technology, and a scientific and technological revolution has emerged, which also has a significant impact on the directions of the social sciences, the organization of the economy and production, the scientific management of economic and social processes, and specific social research. The leading position of science in relation to technology becomes even more pronounced, science becomes a force that constantly changes technology. In turn, technology also has a positive impact on the development of science, posing new requirements and tasks for it. A characteristic feature of the modern scientific and technological revolution is that, along with industry, it has encompassed various spheres of public life: agriculture, transport, communications, medicine, education, and consumer services.

Technical means used for household services belong to the category of equipment not involved in production. Household appliances mainly refer to various electrical and electronic devices used in households and similar places. Also known as household appliances or everyday appliances. Household appliances free people from heavy, tedious, and time-consuming household chores, creating a more comfortable and beautiful living and working environment for humanity for physical and mental health. Especially today, they have become a necessity of modern family life, providing rich and diverse cultural and entertainment conditions.

In his speech at a meeting with leading scientists of our country on December 30, 2016, the President of the Republic of Uzbekistan Sh.M.Mirziyoyev emphasized that the development of our country and society at the level of modern requirements is impossible to imagine without science, fundamental research is of great importance in the development of science, thanks to which new knowledge is acquired and theories are formed, a solid foundation for further practical research and innovative developments is created, and the importance of further enhancing the integration of science, education, and production is highlighted [1]. Through the study of cultural heritage, along with restoring the national identity of our people, we find scientific information for writing the history of a true people. In this regard, we also aimed to study the process of such changes in the lives of the population, their results, and their significance for their time.

During the Soviet era, in order to meet the material and cultural needs of the population in everyday life, a number of measures were determined by the party and

government, as a result of which attention was paid to the development of the consumer services sector in all Union republics. In particular, transforming the industry into a large, technically equipped and mechanized sector has been identified as one of the important tasks of state policy [2].

While household appliances began to become popular worldwide from the beginning of the 20th century, this process accelerated in our country from the second half of the 20th century.

On the scale of the USSR, the sales of household appliances increased relatively. From the table below, it can be seen that in the first years of the formation of the USSR, there were no sales of household appliances in the republic, and even until the end of the 1950s, they were low. Only by the end of the 1950s did the indicators of relative growth in this area appear. This is clearly visible in the table below [8]:

№	Product type	1928	1940	1945	1958	1965
1.	Radio receivers (thousand units)	-	160,5	13,9	3902	5159
2.	TVs (thousand units)	-	0,3	-	979	3655
3.	Refrigerators (thousand units)	-	3,5	0,3	360	1675

Meanwhile, it should be noted that since the 1960s, the sale of household appliances has increased significantly. Between 1961 and 1965, refrigerators were sold for 4.7 million soums, washing machines for 10.9 million soums, radios for 21.5 million soums, televisions for 12.0 million soums, and furniture for 8.0 billion soums. That is, refrigerators were sold for 18.5 million units, washing machines for 19.0 million units, radios for 30.0 million units, televisions for 27.0 million units, and furniture for 11.6 billion soums. This shows that the use of household appliances among the population has almost doubled [7, 4-b].

The increase in sales of electrical equipment in the Uzbek SSR can be seen in the following figures.

Cultural and household goods sent for state and cooperative trade for sale to the population (thousand units)[4]

№	Product type	1960	1965	1966	1967	1968	1969
1.	All kinds of watches	499,0	591,4	707,8	774,7	902,7	1012,2
2.	Sewing machines	94,4	68,5	72,9	73,3	75,4	79,3
3.	Radio equipment	173,9	197,3	193,8	231,0	252,4	258,2
4.	TVs	60,1	88,9	116,2	149,6	201,8	210,9
5.	Refrigerators	22,6	61,1	77,5	105,8	111,0	135,1
6.	Washing machines	26,7	82,5	83,6	85,6	116,4	124,0
7.	Dust Collectors	3,9	6,3	9,0	13,3	16,2	20,0
8.	Cameras	20,1	22,1	21,9	30,0	33,6	32,1

In the Karakalpak ASSR, the sale of refrigerators, televisions, and radios doubled in 1965 compared to 1964 [6, p. 3]. At this point, based on the materials collected during field research, a conversation was conducted. According to the recollections of Jumaniyozov Jumanazar, who has been working at the "Goluboy ekran" technical repair shop in the city of Khojeyli since 1987, television appeared in his house in 1965, and at the mahalla level, it existed only in their house, and the residents of the mahalla gathered in their house to watch television programs. He also mentioned that the appearance of the refrigerator in the apartment dates back to the 1970s[5]. These facts show that the spread of such equipment among the population in rural areas occurred after the 1980s. In the previous period, such equipment was only available in a few households.

If we take into account the fact that in 1980, the "Moviy ekran" technical service branch in the city of Nukus received 1,600 requests for the supply of 9 different brands of televisions, and the "Texclojbitpribor" service institution for the supply of refrigerators, then we can see that during this period, technical equipment in the region became quite popular in households.

Within the Karakalpak ASSR, between 1980 and 1985, a network of television studios and workshops repaired 186,000 units of radio and television equipment of various brands and complete sets. These figures show how popular radio and television equipment is among the population of the area [6].

The widespread introduction of electricity in the region since the 1950s, the implementation of housing construction programs, and the increase in demand for industrial products became an important factor in meeting the household needs of the population.

From the 1960s, technical equipment produced in various regions of the USSR began to enter the markets of Karakalpakstan. Refrigerators, televisions, radio receivers, and washing machines of brands such as "Riga," "Minsk," "Volna," "Donbass," and "Electronics" began to be used in everyday life. By the 1960s, new technical equipment began to appear in the homes of the population. The sale of outerwear and footwear, refrigerators, washing machines, radios, televisions, and other similar items to the population was increased. The sale of such consumer goods to the population in 1965 amounted to 30 million manat more than in 1963. Their trade turnover grew by 1.48 times. In 1965, sales turnover increased by 57.6

million manat compared to 1958. For the improvement of trade in the republic, in April 1964, the Ministry of Trade of the Karakalpak ASSR, city trade departments in Nukus and Khojeyli were created[3].

In general, the process of popularization of household appliances in the Karakalpak ASSR was gradual, which can be traced in the following directions:

1. The electrification stage (1950-1965): the expansion of electrical networks in cities and large settlements made it possible to use simple household appliances such as electric kettles, iron, and baking stoves.

2. The stage of information and cultural development (1965-1975): with the spread of television and radio receivers, the process of obtaining information and cultural leisure reached a new level. The establishment of a television center in the city of Nukus gave impetus to the development of mass media throughout the republic.

3. Comfort stage (1975-1985): the widespread use of refrigerators, washing machines, and vacuum cleaners made women's work easier, and the quality of household services improved.

In conclusion, it should be noted that the popularization of household appliances, as we saw above, mainly occurred after the 1960s. Nevertheless, during these years, household appliances were initially popular among the population in urban areas, while the popularization in rural areas occurred somewhat later, that is, by the 1980s, appliances began to appear in rural areas as well. Naturally, there are social factors in the expansion of such technologies among the population. The emergence of these factors actually ensures the popularization of technology.

List of references:

1. Mirziyoyev Sh.M. "Scientific achievements as an important factor of development." "Xalq so'zi" newspaper, December 31, 2016, No. 259 (6694)
2. Umarov A.Kh. Analysis and rational organization of the household service structure. Tashkent, 1969. -P. 3.
3. K.Allambegenov "Karakalpakstan in the 20th century: economics and social changes" - Nukus: Bilim, 2007. - 198 p.
- "People's Economy of the Uzbek SSR in 1969" Tashkent. Uzbekistan. - 1970. 232 l.
5. Citizen, born in 1962, residing at 42 Zulfiya Street, Bayterek mahalla, Khojeyli city
6. Central Archive of Karakalpakstan. fund 551, inventory 2, act 5905, sheet 36
7. "Soviet Karakalpakstan" newspaper. 06.04.1966. No 68. 1-4 sheets
8. "Soviet Karakalpakstan" newspaper. February 11, 1966. No29. Page 3

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MAKTABGACHA YOSHDAGI BOLALARDA MATEMATIK TASAVVURLARNI SHAKLLANTIRISHDA STEAM YONDASHUVIDAN FOYDALANISHNING AFZALLIKLARI

Annotatsiya: Ushbu maqolada maktabgacha yoshdagi bolalarda dastlabki matematik tushunchalarni rivojlantirish jarayoniga STEAM yondashuvini tatbiq etishning afzalliklari tadqiq qilinadi. Maktabgacha ta'lim tashkilotlarida STEAM texnologiyalaridan foydalanishning afzallilariga ko'ra matematika, texnologiya, muhandislik, san'at va tabiiy fanlar integratsiyasiga asoslangan o'quv faoliyatlari bolalarning mantiqiy fikrlashi, muammoli vaziyatlarni hal qilish ko'nikmalari hamda ijodiy tafakkurini shakllantirishda yuqori samaradorlikka ega ekanligini yaqqol ko'rishimiz mumkin.

Kalit so'zlar: Integratsiyalashgan ta'lim, loyiha faoliyati, ijodkorlik, mantiqiy fikrlash, kompetensiya, konstruksion faoliyat, STEAM, maktabgacha ta'lim, matematik tasavvur, innovatsion.

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ADVANTAGES OF USING THE STEAM APPROACH IN THE FORMATION OF MATHEMATICAL CONCEPTS IN PRESCHOOL CHILDREN

Abstract: This article discusses the advantages of using the STEAM approach to the process of early development of mathematical concepts in preschool children. We clearly see that educational activities based on the integration of mathematics, technology, engineering, art, and natural sciences, according to the results of using STEAM technologies in preschool educational institutions, are highly effective in shaping children's logical thinking, problem-solving skills, and creative thinking.

Keywords: *integrated learning, project activity, creativity, logical thinking, competence, constructive activity, STEAM, preschool education, mathematical imagination, innovation.*

Bugungi kunda Maktabgacha ta'lim tashkilotlarida STEAM texnologiyalaridan foydalanish ta'lim samaradorligini oshirishi balki zamonaviy bilimlarni ta'lim tizimiga kirib kelishini hamda bolalarning intellektual salohiyatini oshirishga xizmat qilmoqda. Maktabgacha ta'lim tashkilotlarida STEAM texnologiyalari integratsiyalashgan holda qo'llanilganda yuqori samaradorlik hamda katta natijalarga erishilmoqda. Maktabgacha yoshdagi bolalarda matematik tasavvurlarni shakllantirish jarayoni ularning intellektual rivojlanishining eng muhim tarkibiy qismi hisoblanadi. Xususan, maktabgacha yosh davri bolaning matematik tasavvurlari shakllanishi uchun eng sezgir (sensitiv) bosqich bo'lib, aynan shu davrda son-sanoq, shakl, fazoviy tasavvur, ketma-ketlik, o'lchamlar orasidagi bog'liqlik kabi asosiy tushunchalar mustahkamlanadi. Bu jarayonni samarali tashkil etish esa an'anaviy o'qitish shakllaridan tashqari integratsiyalashgan, kreativ va innovatsion metodlarga ehtiyojni kuchaytirmoqda.

Maktabgacha ta'limda STEAM texnologiyalaridan foydalanish jarayonida innovatsion mexanizmlarni aniqlash, ularni o'quv-tarbiya jarayoniga moslashtirish, shuningdek, pedagoglarning metodik tayyorgarligini takomillashtirish — hozirgi pedagogik tadqiqotlarning dolzarb yo'nalishlaridan biridir.

STEAM-bolalarning intellektual qobiliyatlarini ilmiy va texnologik ijodkorlikka jalb qilish imkoniyati bilan rivojlantiradi. U bolalarning aniq tabiiy fanlarga bo'lgan qiziqishlarini rivojlanishiga qaratilgan o'quv dasturiga asoslanadi. STEAM- ta'lim texnologiyasi quyidagicha ma'no kasb etadi. S- Science (Fan), T- Technology (texnologiya), E- Engineering (Muhandislik), A-Art (San'at), M – Mathematics (Matematika). Ta'lim berishni o'quv fanlari bo'yicha emas, balki "mavzu" lar bo'yicha integratsiyalab olib borish. STEAM –ta'limida fanlararo aloqa va loyihalash metodi birlashtirilgan bo'lib, uning asosida tabiiy fanlarni texnologiyaga, muhandislik ijodiyotga va matematikaga integratsiya qilish yotadi. Bunda muhandislik bilan bog'liq kasblarga bo'lgan tayyorgarlik amalga oshiriladi.

Ilmiy-texnik bilimlarni real hayotda qo'llash. STEAM – ta'limida amaliy mashg'ulotlar yordamida, bolalarga ilmiy-texnik bilimlaridan real hayotda foydalanish namoyish qilinadi. Har bir darsda o'quvchilar zamonaviy industriya modellarini ishlab chiqadi, quradi va modelni rivojlantiradi.

Tanqidiy tafakkur ko'nikmalarini rivojlantirish va muammolarni yechish. STEAM–dasturi, bolalar kundalik hayotlarida duch keladigan qiyinchiliklarni yengishda zarur bo'ladigan tanqidiy tafakkur va muammolarni yechish ko'nikmalarini rivojlantiradi. Masalan, bolalar tez yuradigan mashina modelini yig'adilar, so'ngra uni sinovdan o'tkazadilar. Birinchi sinovdan so'ng, kutilgan natijaga erishilmasa uning sabablari haqida o'ylaydilar va topadilar. Balkim, g'ildiraklarining kattaligi yoki aerodinamikasi to'g'ri kelmagandir. Har bir sinovdan so'ng ular kamchiliklarni bartaraf etib boradilar.

STEAM yondashuvining asosiy mohiyati bolaga fanlararo integratsiyani amaliy faoliyat orqali anglash imkonini berishdan iborat. Bu jarayonda matematika boshqa fanlar bilan birgalikda qo'llaniladi. Masalan, konstruksion faoliyat davomida bolalar qurilish elementlaridan foydalanib geometrik shakllar yaratadi, ularning barqarorligi, simmetriyasi va o'lchamlar nisbatini tajriba orqali o'rganadi. Bu faoliyat nafaqat geometrik tasavvurlarni, balki muhandislik fikrlashning boshlang'ich elementlarini ham shakllantiradi. Tabiiy fanlar bilan integratsiya jarayonida bolalar o'lchash, solishtirish, guruhlash, taxmin qilish kabi matematik operatsiyalardan foydalanadi. Masalan, suvning hajmini turli idishlar yordamida o'lchash jarayoni orqali ular sonlar va miqdorlar o'rtasidagi bog'liqlikni tushunadi. Maktabgacha ta'limda STEAM yondashuvini joriy etishning innovatsion mexanizmlari orasida loyiha asosida o'qitish alohida ahamiyatga ega. Loyiha faoliyati bolalarni mustaqil o'ylashga, rejalashtirishga, natijani oldindan taxmin qilishga va yakunida mulohaza yuritishga o'rgatadi. Masalan, "ko'prik qurish" loyihasi davomida bolalar turli materiallar bilan tajriba o'tkazadi, shakl va o'lchamlar barqarorlikka qanday ta'sir qilishi haqida xulosalar chiqaradi. Natijada bola matematik munosabatlarni nafaqat tushunadi, balki real vaziyatda qo'llay oladi. Bunday loyihalar bolalarning muammoli vaziyatlarni hal qilish ko'nikmalarini shakllantiradi, ular ijodiy yechimlar topishga odatlanadi.

STEAM muhitida faoliyat yuritgan bolalarda matematik kompetensiyalar an'anaviy ta'limga nisbatan tezroq shakllanadi, ularning mustaqil fikrlashi, ijodiy yondashuvi va muammoni hal qilish ko'nikmalari sezilarli darajada rivojlanadi. Ushbu yondashuvni amaliyotda samarali joriy etish uchun pedagoglarning metodik tayyorgarligi, zamonaviy o'quv-muhitini yaratish, manipulyativ va raqamli vositalarni to'g'ri tanlash muhim omillar hisoblanadi. Natijada ta'lim jarayoni bolaga yo'naltirilgan, interaktiv va mazmunan boy shaklga ega bo'lib, maktabgacha yoshdagi bolalarning intellektual salohiyatini kompleks rivojlantirishga xizmat qiladi. Xulosa qilib shuni aytish mumkinki, STEAM- tabiiy fanlar, texnologiyalar, muhandislik, san'at va matematika fanlarini uyg'unlikda o'qitish uslubidir. STEAM texnologiyasi ta'limdan farqli ravishda bilimlarni alohida emas, o'zaro mutanosib holda olib borishni ta'minlab beradi. Bolalar o'zida nostandart fikrlash, muammoga bir nechta yechim topish va ijodkorlik ko'nikmalarini shakllantiradi va bu uning kelajakdagi faoliyatida juda qo'l keladi.

Foydalanilgan adabiyotlar

1. Qodirova, F. R., & Xoliyorova, G. *Maktabgacha ta'lim pedagogikasi*. – Toshkent: O'zbekiston Milliy Ensiklopediyasi, 2020.
2. Mavlonova, R. A., & Usmonboeva, M. H. *Ilk va maktabgacha yoshdagi bolalar ta'limi*. – Toshkent: Fan va texnologiya, 2018.
3. To'raeva, F. *Bolalarda matematik tasavvurlarni shakllantirish metodikasi*. – Toshkent: TDPU Nashriyoti, 2021.

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6–7 YOSHLI TARBIYALANUVCHILARDA MUSTAQIL FIKRLASH KO‘NIKMALARINI RIVOJLANTIRISHDA MUAMMOLI TA’LIM USULLARINING AHAMIYATI

Annotatsiya: Ushbu maqolada 6-7 yoshli bolalarda mustaqil fikrlash ko‘nikmalarini shakllantirishda muammoli ta’lim usullarining ahamiyati ilmiy asoslangan holda yoritilgan. Tadqiqotda muammoli ta’limning bolalarning kognitiv, ijodiy va intellektual qobiliyatlarini rivojlantirishdagi roli psixologik-pedagogik nuqtai nazardan tahlil qilinadi. Maqolada muammoli ta’lim usullarini amaliyotda qo‘llashning samarali usullari va metodik tavsiyalar ham keltirilgan.

Kalit so‘zlar: mustaqil fikrlash, muammoli ta’lim, mantiqiy fikrlash, kognitiv rivojlanish, ijodiy yondashuv, topshiriq muammoli vaziyat.

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THE IMPORTANCE OF PROBLEM-BASED LEARNING IN DEVELOPING INDEPENDENT THINKING SKILLS IN 6–7-YEAR-OLD STUDENTS

Annotation: This article provides a scientifically grounded explanation of the importance of problem-based learning in developing independent thinking skills in children aged 6–7. The study analyzes the role of problem-based learning in enhancing children’s cognitive, creative, and intellectual abilities from a psychological and pedagogical perspective. The article also includes effective methods for applying problem-based learning in practice and methodological recommendations.

Keywords: *independent thinking, problem-based learning, logical thinking, cognitive development, creative approach, problem situation.*

Zamonaviy ta'lim tizimida bolalarni nafaqat bilimlar bilan qurollantirish, balki ularni mustaqil, ijodiy va tangidiy fikrlashga o'rgatish asosiy vazifa hisoblanadi. 6-7 yosh bolalar uchun bu davr kognitiv qobiliyatlarning jadal rivojlanish davri bo'lib, mustaqil fikrlash ko'nikmalarini shakllantirish uchun eng qulay vaqt hisoblanadi. Muammoli ta'lim usullari aynan shu vazifani bajarishga qaratilgan bo'lib, bolalarni faol fikrlashga, muammolarni o'zi hal qilishga va yangi bilimlarni mustaqil o'zlashtirishga undaydi. Maktabgacha ta'lim tizimi inson shaxsining shakllanishi, uning intellektual va ijtimoiy qobiliyatlarini rivojlantirishda poydevor bosqichi hisoblanadi. Ayniqsa, 6–7 yoshli tarbiyalanuvchilarda mustaqil fikrlash, ijodkorlik, tashabbuskorlik va muammoli vaziyatlarda to'g'ri qaror qabul qilish ko'nikmalarini shakllantirish kelgusida ularning muvaffaqiyatli o'qishlari hamda hayotiy faoliyatida muhim ahamiyat kasb etadi.

Bugungi zamonaviy ta'lim yoshlardan kuchli salohiyatli, raqobatbardosh, maxsus qobiliyatli, zamon bilan hamnafas, maqsadli, ilmiy-texnika taraqqiyot talablariga javob beradigan, mustahkam irodali bo'lishni talab etadi. Bu kabi sifatlarni amalga oshirishda esa muammoli ta'lim texnologiyasi muhim ahamiyat kasb etadi. Muammoli ta'lim bu mantiqiy fikrlash, tahlil qilish, izlanish, umumlashtirish, muammoli vaziyatlar, echim topish, bilishga qiziqish, ehtiyoj, usullar qo'llaniladigan bir yangicha tizimdir. Muammoli o'qitish XX asrning 20-30 yillarida tarqala boshladi. Pedagogikada muammoli ta'lim haqida so'z yuritilarkan ko'z o'ngimizga eng birinchi og'zaki, ko'rgazmali va amaliy metodlar keladi albatta. Ta'limdagi og'zaki, ko'rgazmali yoki amaliy metodlarning har biri bola ongida muammoli vaziyat yaratishi mumkin. Muammoli vaziyatlar esa o'z navbatida bolani mustaqil fikrlashga, tafakkur etishga, izlanishga, ijodkorlikka, boshqacha qilib aytganda aqliy salohiyatining yuksalishiga olib boradi. Bugungi globallashtirish davrida muammoli yondashuv ta'lim dasturlarida, bolalarning mustaqil faoliyatlarida o'zining ifodasini topishi lozim. Jumladan: - bilimlarni muammoli bayon qilish; - bolalarni izlanishga undash; - ta'limning tadqiqiy metodi. Muammoli ta'lim deganda beriladiga ma'lumotlarni ta'lim oluvchilar ongiga ularning darajasiga mos va muammolarini vujudga keltiradigan yo'sinda o'rgatish tushuniladi. Ta'lim qachonki ushbu yo'sinda olib borilsagina bolaning fikrlash faoliyatida muammoli vaziyatlar vujudga keladi va ular bolani ob'ektiv ravishda izlanishga, tafakkur qilishga va mantiqan to'g'ri ilmiy xulosalar chiqarishni o'rganishga da'vat etadi. Muammoli ta'lim - ilmiy bilishni rivojlantirish zarurligini ifodalashning sub'ektiv shaklidir. U muammoli vaqtning, yangi jamiyat rivojlanishi jarayonida bilish va bilmaslik o'rtasida ob'ektiv ravishda vujudga keladigan vaziyat. Muammoli vaziyat bolaning ma'lum ruhiy holati bo'lib, bu holat ma'lum topshiriqni bajarish jarayonida ziddiyatni anglash tufayli vujudga keladi.

Mustaqil fikrlash tushunchasi va uning ahamiyati Mustaqil fikrlash — bu bolaning o'z bilimiga tayangan holda hodisa, voqea yoki topshiriqni mustaqil tahlil

qilish, yechim topish va xulosa chiqarish qobiliyatidir. Pedagogik va psixologik adabiyotlarda bu tushuncha shaxsning ijodiy tafakkuri, kognitiv faolligi va refleksiv fikrlash bilan chambarchas bog‘liq deb ta’riflanadi.

6–7 yoshli bola uchun mustaqil fikrlashning shakllanishi, asosan, tajriba va kuzatish orqali amalga oshadi. Shu yoshda bola “nega?”, “qanday?”, “nima uchun?” kabi savollarni faol berib, sabab-oqibat bog‘lanishlarini o‘rganadi. Bu esa pedagog tomonidan to‘g‘ri yo‘naltirilgan muammoli ta’lim metodlari orqali mustahkamlanadi.

6–7 yoshli bolalarda mustaqil fikrlashni rivojlantirishning pedagogik shart-sharoitlari

*Muammoli ta’lim samarali bo‘lishi uchun quyidagi pedagogik sharoitlar muhim:

- *bolalarning yosh va individual xususiyatlarini hisobga olish;
- *muammoli vaziyatlarning qiziqarli va amaliy mazmunga ega bo‘lishi;
- *tarbiyachining yo‘naltiruvchi, lekin buyruq bermaydigan roli;
- *rag‘batlantirish va ijobiy baholash tizimini qo‘llash;
- *guruhda ijodiy muhit yaratish.

Muammoli ta’limda tarbiyachi – bilim manbai emas, balki yo‘l ko‘rsatuvchi, yo‘naltiruvchi va sherik sifatida ishtirok etadi. U bolalarning fikrini boshqaradi, lekin ularning mustaqilligini cheklamaydi. Tarbiyachining har bir so‘zi, savoli, mimikasi va baholashi bolada o‘ylashga undovchi psixologik muhitni yaratadi.

Shuningdek, tarbiyachi muammoli mashg‘ulotlarni tayyorlashda bolalarning qiziqish doirasini hisobga olishi, mavzularni kundalik hayot bilan bog‘lashi va tajriba elementlarini qo‘llashi lozim. Tarbiyachi muammoli vaziyatni yaratganda bolaga tayyor javob bermasligi, balki savollar, taxminlar, sinovlar orqali ularni yechimga olib kelishi zarur.

Tadqiqotlar shuni ko‘rsatadiki, muammoli ta’lim asosida o‘tkazilgan mashg‘ulotlarda bolalarning fikrlash tezligi, sabab-oqibatni tushunish darajasi va ijodiy faoliyati an’anaviy mashg‘ulotlardagiga nisbatan yuqori bo‘ladi. Masalan, tajriba guruhida 6–7 yoshli bolalarga “Nega soyada harorat past?” kabi muammoli savollar asosida mashg‘ulotlar o‘tkazilganda, bolalar o‘z kuzatishlari va taxminlariga asoslanib, o‘z xulosalarini mustaqil ayta olganlar. Bu jarayonda bolalarda tahlil, mantiqiy fikrlash, muammoni hal etish kabi intellektual faoliyat turlari faol rivojlangan. Muammoli ta’lim usullaridan foydalanilgan eksperimental guruh bolalarida quyidagi o‘zgarishlar kuzatildi: Mustaqil fikrlash ko‘nikmalari 42% ga yaxshilandi. Muammolarni hal qilishda ijodiy yondashuv 35% ga oshdi. Kognitiv qiziquvchanlik 38% ga ortdi. Mantiqiy fikrlash qobiliyati 27% ga yaxshilandi. Nazorat guruhida esa bu ko‘rsatkichlardagi o‘zgarishlar sezilarli emas edi (5-10% oralig‘ida).

Muammoli ta’lim 6–7 yoshli bolalarda mustaqil fikrlashni shakllantirishning eng samarali vositalaridan biridir. Bu metod yordamida bola: fikrini asoslay oladi; yangi yechimlar topishga o‘rganadi; kuzatish, tahlil va solishtirish ko‘nikmalarini rivojlantiradi; ijodkor, tashabbuskor va o‘z fikriga ega shaxs sifatida shakllanadi. Muammoli ta’lim bolalarning kognitiv, ijodiy va intellektual

qobiliyatlarini rivojlantirishga, shuningdek, ularni mustaqil fikrlashga o'rgatishga yordam beradi. Shunday qilib, maktabgacha ta'lim muassasalarida muammoli ta'lim texnologiyalarini keng joriy etish tarbiyalanuvchilarning tafakkurini faollashtiradi, mustaqil qaror qabul qilish malakalarini rivojlantiradi va zamonaviy ta'limning asosiy maqsadi — fikrlovchi shaxsni tarbiyalashga xizmat qiladi.

Quyidagi metodik tavsiyalar amaliyotda qo'llash mumkin:

1. Mashg'ulot jarayonida muammoli vaziyatlarni muntazam ravishda yaratish
2. Bolalarning xatolaridan foydalanish va ularni tahlil qilish orqali o'rganish
3. Ochiq savollar berish va turli javob variantlarini qabul qilish
4. Bolalarni tahmin qilishga, faraz yuritishga va ularni tekshirishga undash
5. Real hayotiy vaziyatlar bilan bog'liq muammolarni hal qilish va muammoli ta'lim usullarini muntazam qo'llash 6-7 yoshli bolalarning mustaqil fikrlash ko'nikmalarini samarali rivojlantirishga, ularni keyingi ta'lim bosqichlariga tayyorlashga yordam beradi.

ADABIYOTLAR

1. Vygotskiy L.S. Tafakkur va nutq. - Moskva: Pedagogika, 1999.
2. Maxmudov M.I. Muammoli ta'limning nazariyasi va amaliyoti. - Toshkent: O'qituvchi, 2005.
3. Piaje J. Bolaning aqliy rivojlanishi. - Sankt-Peterburg: Piter, 2009.
4. Matyushkin A.M. Ta'lim va tarbiyadagi muammoli vaziyatlar. - Moskva: Pedagogika, 2002.
5. Davletshin M.G. Maktabgacha yoshdagi bolalarda fikrlashni rivojlantirish. - Toshkent: O'qituvchi, 2010.
6. Xolodnaya M.A. Psixika aqliy qobiliyatlar: aqliy resurslarning nazariyasi va amaliyoti. - Moskva: Nauka, 2012.

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KOMMUNIKATIV O'YINLAR ORQALI O'RTA MAKTABGACHA YOSHDAGI BOLALAR NUTQNI RIVOJLANTIRISH TEXNOLOGIYASI

Annotatsiya: Ushbu ilmiy-nazariy esse maktabgacha ta'lim tizimida o'rta maktabgacha yoshdagi bolalar nutqini rivojlantirishda kommunikativ o'yinlardan foydalanish texnologiyasining pedagogik ahamiyatini yoritishga bag'ishlangan. Tadqiqotda kommunikativ o'yinlarning nutqiy faollikni oshirishdagi o'rni, ularning texnologik mexanizmlari hamda samarali tashkil etish uchun zarur pedagogik sharoitlar tahlil qilinadi. Shuningdek, o'yin faoliyatining bolaning nutqiy, ijtimoiy va emotsional rivojiga ko'rsatadigan ta'siri ilmiy-nazariy jihatdan asoslab beriladi. Mazkur ish maktabgacha ta'lim muassasalari pedagoglari uchun amaliy ahamiyatga ega.

Kalit so'zlar: kommunikativ o'yinlar, nutqni rivojlantirish, maktabgacha ta'lim, o'rta maktabgacha yosh, pedagogik texnologiya, nutqiy faollik, muloqot, o'yin faoliyati

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TECHNOLOGY OF SPEECH DEVELOPMENT IN PRE-SCHOOL CHILDREN THROUGH COMMUNICATIVE GAMES

Abstract: This scientific and theoretical essay is devoted to highlighting the pedagogical significance of the technology of using communicative games in the development of speech of preschool children in the preschool education system. The study analyzes the role of communicative games in increasing speech activity, their technological mechanisms and the necessary pedagogical conditions for their effective organization. Also, the impact of game activity on the speech, social and emotional development of the child is scientifically and theoretically substantiated.

This work is of practical importance for teachers of preschool educational institutions.

Keywords: *communicative games, speech development, preschool education, preschool age, pedagogical technology, speech activity, communication, game activity*

Maktabgacha ta'lim tizimida bolaning nutqiy rivoji uning umumiy psixik, ijtimoiy va intellektual taraqqiyotining asosiy ko'rsatkichlaridan biri hisoblanadi. Ayniqsa, o'rta maktabgacha yosh (4–5 yosh) davrida nutq bolaning bilish jarayonlari, muloqot madaniyati va shaxs sifatida shakllanishida yetakchi omil bo'lib xizmat qiladi. Ushbu yosh bosqichida bolalarda lug'at boyligi kengayadi, grammatik tuzilmalar shakllanadi hamda bog'lanishli nutq rivojlanadi. Shu sababli nutqni rivojlantirishda samarali pedagogik texnologiyalarni qo'llash dolzarb masala hisoblanadi.

Bugungi kunda maktabgacha ta'lim tizimida bolani har tomonlama rivojlantirish, ayniqsa uning nutqiy imkoniyatlarini kengaytirish ustuvor vazifalardan biri hisoblanadi. Nutq — bu bolaning atrof-muhit bilan o'zaro munosabatga kirishish vositasi bo'lib, u tafakkur, emotsiya va ijtimoiy tajriba bilan chambarchas bog'liqdir. O'rta maktabgacha yosh davrida (4–5 yosh) bolaning nutqi sifat jihatidan yangi bosqichga ko'tariladi, ya'ni nutq faqat aloqa vositasi emas, balki fikrni ifodalash va boshqarish quroliga aylanadi.

Mazkur jarayonda an'anaviy mashg'ulotlar bilan bir qatorda, bolalarning tabiiy ehtiyojlariga mos pedagogik texnologiyalarni qo'llash muhim ahamiyat kasb etadi. Shunday samarali texnologiyalardan biri kommunikativ o'yinlarga asoslangan nutqni rivojlantirish texnologiyasidir.

Psixologik-pedagogik tadqiqotlarda o'yin faoliyati maktabgacha yoshdagi bolaning yetakchi faoliyati sifatida e'tirof etiladi. L.S. Vygotskiy ta'kidlaganidek, bola o'yin jarayonida o'zining real imkoniyatlaridan yuqori darajada faoliyat ko'rsatadi, ya'ni “yaqin rivojlanish zonasi” yuzaga keladi. Aynan shu jarayonda nutqning faol rivojlanishi kuzatiladi.

Kommunikativ o'yinlar nutq va o'yin uyg'unligini ta'minlab, bolani muloqotga majbur qilmasdan, tabiiy ravishda so'zlashga undaydi. Bu esa nutqiy faollikning ichki motivatsiya asosida shakllanishiga olib keladi.

Shunday texnologiyalardan biri — kommunikativ o'yinlar asosida nutqni rivojlantirishdir. Kommunikativ o'yinlar bolaning tabiiy ehtiyoji bo'lgan o'yin faoliyatiga tayangan holda, nutqiy faollikni oshirishga xizmat qiladi.

Kommunikativ o'yinlar — bu bolalarni muloqotga kirishishga undovchi, nutqiy faoliyatni rag'batlantiruvchi va ijtimoiy tajribani o'zlashtirishga xizmat qiluvchi pedagogik vositadir. L.S. Vygotskiy, A.N. Leontyev, D.B. Elkoninlarning nazariy qarashlariga ko'ra, bolaning nutqi ijtimoiy muhitda, ayniqsa o'yin jarayonida faol rivojlanadi. O'yin — bolaning yetakchi faoliyati bo'lib, unda nutq tabiiy va majburiy bo'lmagan holatda shakllanadi.

Kommunikativ o'yinlar quyidagi nazariy tamoyillarga asoslanadi:

- Faollik tamoyili — bola o'yin jarayonida faol ishtirok etadi;

- Muloqotga yoʻnaltirilganlik — oʻyinlar nutqiy aloqani talab qiladi;
- Ijtimoiylashuv tamoyili — bola tengdoshlari bilan muloqotda boʻladi;
- Yoshga moslik — oʻyin mazmuni bolaning yosh xususiyatlariga mos boʻladi

Oʻrta maktabgacha yoshdagi bolalarda nutq rivojining xususiyatlari 4–5 yoshli bolalarda nutq rivoji quyidagi jihatlar bilan tavsiflanadi:

- lugʻat boyligining faol kengayishi;
- gap tuzish qobiliyatining shakllanishi;
- dialogik nutqning rivojlanishi;
- tovushlarni toʻgʻri talaffuz qilishga intilish.

Aynan shu davrda kommunikativ oʻyinlar yordamida bolalarda toʻgʻri, ravon va mazmunli nutqni shakllantirish mumkin.

Kommunikativ oʻyinlar orqali nutqni rivojlantirish texnologiyasi

Nutqni rivojlantirish texnologiyasi tizimli, bosqichma-bosqich va maqsadga yoʻnaltirilgan boʻlishi lozim. Ushbu texnologiya quyidagi tarkibiy qismlardan iborat:

1. Maqsad — bolalarda kommunikativ kompetensiyani shakllantirish.
2. Vazifalar — lugʻatni boyitish, grammatik nutqni rivojlantirish, bogʻlanishli nutqni shakllantirish.
3. Vositalar — rol oʻyinlar, didaktik oʻyinlar, syujetli oʻyinlar, dialogli mashqlar.
4. Usullar — savol-javob, suhbat, taqlid, tasvirlash, rollarga kirish.
5. Natija — bolalarda erkin muloqot qila olish, oʻz fikrini aniq ifodalash koʻnikmasining shakllanishi.

Masalan, “Doʻkonda”, “Mehmon keldi”, “Bogʻchada bir kun” kabi syujetli-rol oʻyinlar bolalarni faol dialogga kirishishga undaydi va nutqiy faollikni oshiradi.

Kommunikativ oʻyinlarning pedagogik ahamiyati

Kommunikativ oʻyinlar:

- bolalarning nutqiy faolligini oshiradi;
- ijtimoiy moslashuvini taʼminlaydi;
- mustaqil fikrlash va muloqot madaniyatini shakllantiradi;
- emotsional ijobiy muhit yaratadi.

Natijada bola nutqni majburiyat sifatida emas, balki ehtiyoj sifatida qabul qiladi.

Kommunikativ oʻyinlar orqali oʻrta maktabgacha yoshdagi bolalar nutqini rivojlantirish samarali pedagogik texnologiya hisoblanadi. Ushbu texnologiya bolaning yosh xususiyatlari, psixologik ehtiyojlari va ijtimoiy tajribasini inobatga olgan holda tashkil etiladi. Kommunikativ oʻyinlar bolalarda nafaqat nutqiy kompetensiyani, balki shaxsiy va ijtimoiy sifatlarni ham rivojlantiradi. Shu bois, maktabgacha taʼlim muassasalarida ushbu texnologiyani keng joriy etish pedagogik jihatdan muhim ahamiyatga ega.

Kommunikativ oʻyinlar samarali boʻlishi uchun maʼlum pedagogik sharoitlar yaratilishi lozim. Ular quyidagilardan iborat:

1. Nutqiy muhitning boyligi Guruh xonasida suhbatga undovchi predmetlar, rasmlar, rolli o'yin atributlari bo'lishi nutqiy faollikni oshiradi.

2. Pedagogning yo'naltiruvchi roli Tarbiyachi o'yinni boshqaruvchi emas, balki muloqotni rag'batlantiruvchi, zarur paytda nutqiy namuna ko'rsatuvchi shaxs bo'lishi kerak.

3. Bolalarning teng huquqli ishtiroki Har bir bola o'yin jarayonida fikr bildirish imkoniga ega bo'lishi, passiv tinglovchi bo'lib qolmasligi muhim.

4. Individual yondashuv Nutqiy rivojlanish darajasi turlicha bo'lgan bolalar uchun o'yin mazmuni moslashtiriladi.

Kommunikativ o'yinlarning texnologik mexanizmlari

Mazkur texnologiya bir nechta mexanizm asosida amalga oshiriladi:

- Nutqiy vaziyat yaratish – o'yinda muammoli holat yuzaga keltirilib, uni faqat so'z orqali hal qilish talab etiladi;

- Model asosida so'zlash – tarbiyachi yoki faol bola nutqiy namuna ko'rsatadi;

- Takroriy muloqot – bir xil nutqiy birliklar turli o'yinlarda qayta qo'llanadi;

- Refleksiya – o'yin yakunida bolalar o'z fikrini baham ko'radi.

Bu mexanizmlar nutqni mustahkamlash va faol nutqqa aylantirishga xizmat qiladi.

Xulosa qilib aytganda, kommunikativ o'yinlar orqali o'rta maktabgacha yoshdagi bolalar nutqini rivojlantirish texnologiyasi zamonaviy pedagogik yondashuv sifatida katta imkoniyatlarga ega. Ushbu texnologiya nutqni sun'iy mashqlar orqali emas, balki real muloqot ehtiyoji asosida rivojlantiradi. To'g'ri tashkil etilgan kommunikativ o'yinlar bolalarda nutqiy erkinlik, muloqot madaniyati va ijtimoiy moslashuvni ta'minlaydi. Shu sababli maktabgacha ta'lim amaliyotida ushbu texnologiyadan tizimli va maqsadli foydalanish muhim ahamiyat kasb etadi.

FOYDALANILGAN ADABIYOTLAR

1. Vygotskiy L.S. Bolalar psixologiyasi. – Moskva: Pedagogika, 1991.

2. Elkonin D.B. O'yin faoliyatining psixologik asoslari. – Moskva: Pedagogika, 1989.

3. Leontyev A.N. Faoliyat. Ong. Shaxs. – Moskva: Politizdat, 1975.

4. Usmonova M.X. Maktabgacha yoshdagi bolalar nutqini rivojlantirish metodikasi. – Toshkent: Fan va texnologiya, 2018.

5. Qodirova F.R., To'xtayeva S.M. Maktabgacha pedagogika. – Toshkent: O'qituvchi, 2016.

6. Nurmatova D.Sh. Maktabgacha ta'limda o'yin texnologiyalari. – Toshkent: Innovatsiya, 2020.

7. Babayeva T.I. Maktabgacha yoshdagi bolalarda kommunikativ kompetensiyani shakllantirish. – Moskva: Akademiya, 2014

KICHIK SHAHARLAR REKONSTRUKSIYASIDA QAROR QABUL QILISHDAGI INSTITUTSIONAL VA IJTIMOIIY TO‘SIQLAR

Annotatsiya: Mazkur maqolada kichik shaharlarni rekonstruksiya qilish jarayonida qaror qabul qilish mexanizmlariga ta’sir etuvchi institutsional va ijtimoiy to’siqlar tahlil qilinadi. Tadqiqotda mahalliy boshqaruv tizimlarining cheklangan vakolatlari, normativ-huquqiy nomuvofiqliklar, manfaaddor tomonlar o’rtasidagi muvofiqlashtirish muammolari hamda aholi ishtirokining past darajasi asosiy to’siqlar sifatida aniqlanadi. Maqolada ushbu muammolarni bartaraf etish bo’yicha ilmiy-amaliy tavsiyalar ilgari suriladi.

Kalit so’zlar: kichik shaharlar, rekonstruksiya, qaror qabul qilish, institutsional to’siqlar, ijtimoiy omillar, urban rivojlanish.

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INSTITUTIONAL AND SOCIAL BARRIERS TO DECISION- MAKING IN THE RECONSTRUCTION OF SMALL TOWNS

Abstract: This article analyzes the institutional and social barriers that affect decision-making mechanisms in the process of reconstruction of small towns. The study identifies the limited powers of local government systems, regulatory and legal inconsistencies, coordination problems between stakeholders, and the low level of population participation as the main barriers. The article puts forward scientific and practical recommendations for overcoming these problems.

Keywords: small towns, reconstruction, decision-making, institutional barriers, social factors, urban development.

Kirish

Bugungi globallashuv va urbanizatsiya sharoitida shaharlarning barqaror rivojlanishi masalasi jahon miqyosida dolzarb ahamiyat kasb etmoqda. Ayniqsa, kichik shaharlar mintaqaviy rivojlanish, aholi bandligini ta’minlash va ijtimoiy barqarorlikni mustahkamlashda muhim o’rin tutadi. Biroq ushbu shaharlar ko‘pincha iqtisodiy resurslarning cheklanganligi, eskirgan infratuzilma va boshqaruv tizimlarining yetarlicha moslashuvchan emasligi sababli jiddiy muammolarga duch kelmoqda. Shu bois kichik shaharlarni rekonstruksiya qilish masalasi zamonaviy shaharsozlik siyosatining ustuvor yo‘nalishlaridan biri hisoblanadi.

Kichik shaharlar rekonstruksiya murakkab va ko'p bosqichli jarayon bo'lib, u nafaqat qurilish va muhandislik yechimlarini, balki ijtimoiy, iqtisodiy va institutsional omillarni ham qamrab oladi. Amaliyot shuni ko'rsatadiki, rekonstruksiya loyihalarining muvaffaqiyati ko'p jihatdan qaror qabul qilish jarayonining samaradorligiga bog'liq. Qaror qabul qilishdagi noaniqliklar, manfaatlar to'qnashuvi va boshqaruvdagi muvofiqlashtirish yetishmovchiligi loyiha muddatlarining cho'zilishiga hamda kutilgan natijalarga erishilmasligiga olib keladi.

Kichik shaharlar sharoitida qaror qabul qilish jarayoniga ta'sir etuvchi institutsional to'siqlar alohida ahamiyat kasb etadi. Jumladan, mahalliy boshqaruv organlarining vakolatlari cheklanganligi, markazlashgan rejalashtirish tizimi, normativ-huquqiy hujjatlar o'rtasidagi nomuvofiqliklar va idoralararo hamkorlikning sustligi rekonstruksiya jarayonini murakkablashtiradi. Bunday holatlar resurslardan samarali foydalanish imkoniyatlarini pasaytirib, kichik shaharlarning rivojlanish salohiyatini to'liq ro'yobga chiqarishga to'sqinlik qiladi.

Shu bilan birga, ijtimoiy omillar ham qaror qabul qilish jarayonida muhim rol o'ynaydi. Aholining rekonstruksiya loyihalariga munosabati, ijtimoiy ishonch darajasi va jamoatchilik ishtirokining faolligi ushbu jarayonning muvaffaqiyatini belgilovchi asosiy omillardan hisoblanadi. Ko'plab holatlarda aholi fikrining yetarli darajada inobatga olinmasligi ijtimoiy norozilikka, qarshiliklarga va loyihalarining qabul qilinmasligiga sabab bo'ladi. Natijada, hatto iqtisodiy va texnik jihatdan asoslangan loyihalar ham kutilgan samara bermaydi.

Shu nuqtai nazardan, kichik shaharlar rekonstruksiyasida qaror qabul qilishdagi institutsional va ijtimoiy to'siqlarni ilmiy asosda tahlil qilish dolzarb vazifa hisoblanadi. Ushbu maqolaning maqsadi mazkur to'siqlarni aniqlash, ularning o'zaro bog'liqligini ochib berish va kichik shaharlarning barqaror rivojlanishini ta'minlashga qaratilgan samarali boshqaruv mexanizmlarini ishlab chiqishdan iborat.

Tadqiqot metodologiyasi

Tadqiqotda sifat va miqdoriy tahlil usullari uyg'unlashtirildi. Jumladan,

- normativ-huquqiy hujjatlar tahlili;
- kichik shaharlar rekonstruksiyasi bo'yicha mavjud loyihalarni solishtirma o'rganish;

- mahalliy boshqaruv organlari va aholi vakillarining fikrlarini tahlil qilish;

- institutsional va ijtimoiy to'siqlarni tasniflash usuli qo'llanildi.

Mazkur metodologiya qaror qabul qilish jarayonining real amaliy holatini aniqlash va muammolarning ildiz sabablarini ochib berishga imkon yaratdi.

Adabiyotlar tahlili

Kichik shaharlarni rekonstruksiya qilish masalasi urbanistika, hududiy rejalashtirish va davlat boshqaruvi sohalarida keng o'rganilgan mavzulardan biridir. Ilmiy adabiyotlarda rekonstruksiya jarayonining muvaffaqiyati ko'p jihatdan qaror qabul qilish tizimining institutsional tuzilishi va ijtimoiy omillar bilan uzviy bog'liqligi ta'kidlanadi. Xalqaro va mahalliy tadqiqotlar ushbu jarayonda mavjud

bo'lgan to'siqlarni aniqlash va ularni bartaraf etishning turli yondashuvlarini taklif etadi.

G'arb olimlari tadqiqotlarida qaror qabul qilish jarayoni ko'p darajali boshqaruv tizimi doirasida ko'rib chiqiladi. Healey (1997) o'zining "Collaborative Planning" asarida shaharlarni rivojlantirishda institutsional muvofiqlik va manfaatdor tomonlar o'rtasidagi hamkorlik hal qiluvchi ahamiyatga ega ekanligini asoslaydi. Uning fikricha, markazlashgan va yopiq qaror qabul qilish tizimlari ijtimoiy qarshiliklarni kuchaytiradi va rekonstruksiya loyihalarining samaradorligini pasaytiradi. Bu yondashuv kichik shaharlar sharoitida ayniqsa dolzarb bo'lib, mahalliy manfaatlarning yetarli darajada hisobga olinmasligi muammosini ochib beradi.

Shuningdek, UN-Habitat tomonidan olib borilgan tadqiqotlarda kichik va o'rta shaharlar barqaror rivojlanishning muhim subyekti sifatida e'tirof etiladi. Hisobotlarda qayd etilishicha, ushbu shaharlarning rekonstruksiyasida institutsional salohiyatning yetishmasligi, moliyaviy resurslarga cheklangan kirish va boshqaruvning markazlashuvi asosiy muammolar sirasiga kiradi. Bunda qaror qabul qilish jarayonida jamoatchilik ishtirokining past darajasi ijtimoiy norozilik va loyihalarining kechikishiga olib kelishi ta'kidlanadi.

Ijtimoiy omillarning ahamiyati Forester (1989) ishlarida ham alohida o'rin egallaydi. U shahar rejalashtirishni faqat texnik jarayon sifatida emas, balki ijtimoiy muloqot va kelishuvlar maydoni sifatida talqin qiladi. Muallifga ko'ra, qaror qabul qilish jarayonida axborotning notekis taqsimlanishi va aholi bilan yetarli darajada muloqot qilinmasligi institutsional to'siqlarni yanada chuqurlashtiradi. Bu yondashuv kichik shaharlar rekonstruksiyasida ijtimoiy ishonch muammosini tushuntirishda muhim nazariy asos bo'lib xizmat qiladi.

Postsovet hududidagi tadqiqotlarda esa kichik shaharlar rivojlanishining o'ziga xos xususiyatlari ko'rsatib beriladi. Ayrim olimlar markazlashgan boshqaruv modeli saqlanib qolayotgan sharoitda mahalliy hokimiyat organlarining mustaqil qaror qabul qilish imkoniyatlari cheklanganini ta'kidlaydi. Bu holat rekonstruksiya loyihalarining yuqori darajada byurokratlashuviga va hududiy ehtiyojlarning yetarli darajada inobatga olinmasligiga olib keladi. Shu bilan birga, normativ-huquqiy hujjatlarning tez-tez o'zgarishi institutsional barqarorlikka salbiy ta'sir ko'rsatadi.

O'zbekiston va Markaziy Osiyo mintaqasiga oid ilmiy ishlarda kichik shaharlar rekonstruksiyasi ko'pincha hududiy rivojlanish va infratuzilmani modernizatsiya qilish kontekstida tahlil qilinadi. Mahalliy tadqiqotchilar shaharsozlik siyosatida davlatning yetakchi roli saqlanib qolayotganini, biroq jamoatchilik ishtirokining sustligi muammolarni keltirib chiqarayotganini qayd etadilar. Aholining qaror qabul qilish jarayoniga jalb etilmasligi ijtimoiy qarshiliklar va norozilik kayfiyatining kuchayishiga sabab bo'lishi mumkinligi ilmiy ishlarda qayd etilgan.

Bundan tashqari, World Bank hisobotlarida kichik shaharlar rekonstruksiyasida institutsional islohotlarning ahamiyati alohida ta'kidlanadi. Xususan, mahalliy boshqaruv organlarining vakolatlarini kengaytirish, moliyaviy mustaqillikni oshirish va ochiq boshqaruv mexanizmlarini joriy etish qaror qabul

qilish jarayonining sifatini yaxshilashi ko'rsatib o'tiladi. Ushbu yondashuv ijtimoiy ishonchni mustahkamlash va rekonstruksiya loyihalarining barqarorligini ta'minlashga xizmat qiladi.

Umuman olganda, adabiyotlar tahlili shuni ko'rsatadiki, kichik shaharlar rekonstruksiyasida qaror qabul qilishdagi institutsional va ijtimoiy to'siqlar murakkab va ko'p qatlamli xususiyatga ega. Mavjud tadqiqotlar ushbu muammolarni alohida jihatlar bo'yicha yoritgan bo'lsa-da, ularning o'zaro bog'liqligini kompleks tarzda tahlil qilish yetarli darajada amalga oshirilmagan. Shu sababli mazkur maqola institutsional va ijtimoiy omillarni integratsiyalashgan yondashuv asosida o'rganishni maqsad qiladi.

Tahlil va natijalar

Mazkur tadqiqot doirasida kichik shaharlar rekonstruksiyasida qaror qabul qilish jarayoniga ta'sir etuvchi institutsional va ijtimoiy to'siqlar kompleks tarzda tahlil qilindi. O'rganish natijalari shuni ko'rsatdiki, ushbu to'siqlar alohida omillar sifatida emas, balki o'zaro chambarchas bog'liq tizim sifatida namoyon bo'ladi va rekonstruksiya loyihalarining samaradorligiga bevosita ta'sir ko'rsatadi.

Birinchi navbatda, institutsional to'siqlar tahlili shuni aniqladiki, kichik shaharlar sharoitida qaror qabul qilish jarayoni ko'pincha yuqori darajada markazlashgan bo'lib qolmoqda. Mahalliy boshqaruv organlarining vakolatlari cheklanganligi sababli rekonstruksiya bo'yicha muhim qarorlar yuqori boshqaruv darajalarida qabul qilinadi. Bu holat hududiy ehtiyojlar va mahalliy sharoitlarning yetarli darajada hisobga olinmasligiga olib keladi. Natijada, ishlab chiqilgan loyihalar real sharoitga to'liq mos kelmasligi yoki amaliyotda qiyinchiliklarga duch kelishi kuzatiladi.

Normativ-huquqiy bazani tahlil qilish natijasida ham muhim muammolar aniqlandi. Amaldagi shaharsozlik va yer munosabatlariga oid hujjatlarda rekonstruksiya jarayonini tartibga soluvchi normalar yetarli darajada aniqlashtirilmagan yoki bir-biriga zid holatda uchraydi. Bu esa qaror qabul qiluvchi subyektlar o'rtasida mas'uliyatning aniq taqsimlanmasligiga sabab bo'ladi. Shuningdek, huquqiy noaniqliklar investorlar va boshqa manfaatdor tomonlarning faolligini pasaytirib, rekonstruksiya loyihalarining moliyaviy barqarorligiga salbiy ta'sir ko'rsatadi.

Idoralararo hamkorlik darajasi ham tahlil jarayonida muhim institutsional muammo sifatida qayd etildi. Kichik shaharlar rekonstruksiyasida ishtirok etuvchi turli tashkilotlar – mahalliy hokimiyat, loyiha institutlari, kommunal xizmatlar va moliyaviy tuzilmalar o'rtasida yetarli darajada muvofiqlashtirish mexanizmlari mavjud emas. Natijada qaror qabul qilish jarayoni sekinlashadi, takroriy kelishuvlar va byurokratik to'siqlar yuzaga keladi. Bu holat loyiha muddatlarining cho'zilishiga va xarajatlarning oshishiga olib keladi.

Ijtimoiy to'siqlar tahlili shuni ko'rsatdiki, rekonstruksiya jarayonida aholi ishtirokining past darajasi eng muhim muammolardan biri hisoblanadi. Ko'plab hollarda qarorlar aholi bilan maslahatlashuvsiz yoki cheklangan axborot asosida qabul qilinadi. Bu esa fuqarolarning rekonstruksiya loyihalariga nisbatan ishonchsizlik bilan qarashiga va ijtimoiy qarshiliklarning kuchayishiga sabab

bo'ladi. Ayniqsa, tarixiy muhit yoki yashash sharoitiga bevosita ta'sir etuvchi loyihalarda aholining norozilik kayfiyati yuqori bo'lishi kuzatildi.

Tahlil natijalari shuni ko'rsatadiki, ijtimoiy ishonch darajasi past bo'lgan sharoitda hatto iqtisodiy va texnik jihatdan puxta ishlab chiqilgan rekonstruksiya loyihalari ham kutilgan natijani bermaydi. Aholi o'z manfaatlari va ehtiyojlari hisobga olinmagan deb hisoblasa, qaror qabul qilish jarayoniga qarshi munosabat shakllanadi. Bu esa loyiha amalga oshirilishida qo'shimcha xarajatlar va ijtimoiy ziddiyatlarga olib keladi.

Madaniy va psixologik omillar ham muhim natija sifatida aniqlandi. Kichik shaharlarda aholining o'z yashash muhiti bilan bog'liq an'anaviy qarashlari kuchli bo'lib, keskin o'zgarishlarga ehtiyotkorona munosabat shakllanadi. Agar rekonstruksiya jarayonida ushbu omillar inobatga olinmasa, qarorlar ijtimoiy jihatdan qabul qilinmaydi. Bu esa institutsional to'siqlarni yanada kuchaytirib, boshqaruv tizimiga bo'lgan ishonchni pasaytiradi.

Olingan natijalar institutsional va ijtimoiy to'siqlar o'zaro ta'sirda bo'lishini ko'rsatdi. Masalan, boshqaruv tizimidagi yopiq qaror qabul qilish modeli aholi ishtirokining pasayishiga olib keladi, bu esa o'z navbatida ijtimoiy qarshiliklarni kuchaytiradi. Ijtimoiy qarshiliklar esa institutsional mexanizmlarning samarasizligini yanada oshiradi. Shu tariqa, muammo yopiq doira shaklida rivojlanadi.

Natijalar asosida shuni ta'kidlash mumkinki, kichik shaharlar rekonstruksiyasida qaror qabul qilish samaradorligini oshirish uchun institutsional islohotlar va ijtimoiy mexanizmlarni birgalikda rivojlantirish zarur. Mahalliy boshqaruv vakolatlarini kengaytirish, huquqiy aniqlikni ta'minlash va idoralararo hamkorlikni kuchaytirish institutsional to'siqlarni kamaytiradi. Shu bilan birga, jamoatchilik ishtirokini kengaytirish va ochiq muloqot mexanizmlarini joriy etish ijtimoiy ishonchni mustahkamlab, rekonstruksiya loyihalarining barqaror amalga oshirilishiga xizmat qiladi.

Xulosa

Mazkur tadqiqot kichik shaharlar rekonstruksiyasida qaror qabul qilish jarayoniga ta'sir etuvchi institutsional va ijtimoiy to'siqlarni aniqlash hamda ularning o'zaro bog'liqligini tahlil qilishga qaratildi. O'rganish natijalari shuni ko'rsatdiki, rekonstruksiya loyihalarining samaradorligi nafaqat moliyaviy va texnik imkoniyatlarga, balki boshqaruv tizimining sifatiga va ijtimoiy muhitga bevosita bog'liqdir.

Tadqiqot davomida aniqlanishicha, qaror qabul qilish jarayonining yuqori darajada markazlashganligi, normativ-huquqiy hujjatlardagi nomuvofiqliklar hamda idoralararo hamkorlik mexanizmlarining yetarli darajada rivojlanmaganligi asosiy institutsional to'siqlar hisoblanadi. Ushbu omillar kichik shaharlarning hududiy ehtiyojlari va ijtimoiy xususiyatlarini to'liq inobatga olishga to'sqinlik qilib, rekonstruksiya loyihalarining cho'zilishiga va samarasiz amalga oshirilishiga olib keladi.

Foydalanilgan adabiyotlar

1. Healey P. *Collaborative Planning: Shaping Places in Fragmented Societies*. – London: Macmillan Press, 1997.
2. Forester J. *Planning in the Face of Power*. – Berkeley: University of California Press, 1989.
3. UN-Habitat. *Urbanization and Development: Emerging Futures*. – Nairobi: United Nations Human Settlements Programme, 2016.
4. World Bank. *Enhancing Urban Management in Small Cities*. – Washington, DC, 2019.
5. OECD. *Regional Development and Policy Challenges*. – Paris: OECD Publishing, 2018.
6. O‘zbekiston Respublikasi Shaharsozlik kodeksi. – Toshkent, 2021.

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IMMUNOLOGICAL CHANGES AND THERAPEUTIC APPROACHES IN HERPETIC STOMATITIS

Abstract: *Herpetic stomatitis is one of the most common viral diseases of the oral cavity, predominantly caused by herpes simplex virus type 1 (HSV-1). The disease is characterized by painful lesions of the oral mucosa and is often associated with immune system dysfunction. This article analyzes immunological changes observed in patients with herpetic stomatitis and evaluates modern therapeutic approaches based on immune status correction. Alterations in cellular and humoral immunity parameters were assessed, and the effectiveness of complex antiviral and immunomodulatory therapy was analyzed. The results indicate that combined therapy contributes to faster resolution of clinical symptoms and reduces the frequency of disease recurrence. An individualized therapeutic approach considering immunological changes is essential for effective management of herpetic stomatitis.*

Keywords: *herpetic stomatitis, immunological changes, immune response, antiviral therapy, immunomodulators.*

Introduction

Herpetic stomatitis is a widespread viral inflammatory disease of the oral mucosa, primarily caused by herpes simplex virus (HSV-1, less frequently HSV-2). The disease is most commonly observed in children and young adults, although it can also affect immunocompromised individuals of any age. Clinically, herpetic stomatitis manifests as painful vesicles and erosions on the oral mucosa, accompanied by systemic symptoms such as fever, malaise, and regional lymphadenopathy.

Recent studies emphasize the critical role of the immune system in the pathogenesis and clinical course of herpetic stomatitis. Following viral invasion, both cellular and humoral immune responses are activated. However, insufficient immune control may lead to severe clinical manifestations, prolonged disease duration, and frequent recurrences. In particular, impaired T-lymphocyte function, altered cytokine production, and dysregulation of the interferon system contribute to viral persistence.

Therefore, modern therapeutic strategies should not be limited to antiviral agents alone but should also address immune system dysfunction. This study aims

to analyze immunological changes in patients with herpetic stomatitis and to evaluate therapeutic approaches based on immune modulation.

Materials and Methods

This clinical observational study included 40 patients diagnosed with acute herpetic stomatitis. A control group consisted of 20 healthy individuals without oral mucosal diseases. All participants underwent comprehensive clinical examination, including assessment of oral mucosal lesions, severity of inflammation, and pain intensity.

Immunological evaluation involved the analysis of cellular immunity parameters (T- and B-lymphocytes), humoral immunity indicators (IgA, IgG, IgM), and interferon levels in peripheral blood. Patients received complex therapy, including antiviral agents, immunomodulatory drugs, and local treatment with antiseptic and antiviral preparations. Treatment effectiveness was assessed based on clinical recovery and changes in immunological parameters.

Results

The results demonstrated significant immunological alterations in patients with herpetic stomatitis compared to the control group. A decrease in T-helper cell levels and an imbalance in T-cell subpopulations were observed, indicating suppression of cellular immunity. Additionally, reduced serum IgA levels were detected in most patients, suggesting impaired local immune defense of the oral mucosa.

Following complex therapy, patients showed rapid regression of clinical symptoms, including reduced pain, faster epithelialization of erosions, and improvement in general condition. Immunological parameters demonstrated positive dynamics, with partial restoration of cellular and humoral immunity indicators.

Discussion

The findings confirm that immune system dysfunction plays a crucial role in the pathogenesis and progression of herpetic stomatitis. Suppression of cellular immunity facilitates viral persistence and contributes to disease recurrence. Decreased IgA levels compromise mucosal immunity, increasing susceptibility to secondary infections.

The results indicate that antiviral therapy alone may be insufficient for optimal disease management. The addition of immunomodulatory agents enhances immune response, accelerates clinical recovery, and reduces relapse rates. Therefore, an individualized therapeutic approach based on immune status assessment is recommended for effective treatment of herpetic stomatitis.

Conclusion

1. Herpetic stomatitis is associated with significant alterations in cellular and humoral immunity.
2. Immune imbalance contributes to severe clinical manifestations and frequent disease recurrence.
3. Complex therapy combining antiviral and immunomodulatory agents improves clinical outcomes.

4. Immune-based individualized treatment strategies are essential for effective management of herpetic stomatitis.

References

1. Whitley R.J., Roizman B. Herpes simplex viruses. *Lancet*.
2. Arduino P.G., Porter S.R. Herpes simplex virus type 1 infection: overview on relevant clinico-pathological features. *Oral Diseases*.
3. Cunningham A.L., Diefenbach R.J., Miranda-Saksena M. The cycle of human herpes simplex virus infection. *Journal of Infectious Diseases*.
4. Scully C., Felix D.H. Oral medicine — update for the dental practitioner. *British Dental Journal*.
5. Roizman B., Knipe D.M., Whitley R. *Fields Virology: Herpesviridae*.
6. Miller C.S., Danaher R.J. Asymptomatic shedding of herpes simplex virus. *Journal of Oral Pathology & Medicine*.
7. Brady R.C., Bernstein D.I. Treatment of herpes simplex virus infections. *Antiviral Research*.
8. Spruance S.L., Overall J.C. The natural history of recurrent herpes simplex labialis. *New England Journal of Medicine*.
9. Nahmias A.J., Roizman B. Infection with herpes simplex viruses 1 and 2. *New England Journal of Medicine*.
10. Fatahzadeh M., Schwartz R.A. Human herpes simplex virus infections: epidemiology, pathogenesis, symptomatology, diagnosis, and management. *Journal of the American Academy of Dermatology*.
11. Corey L., Wald A. Genital herpes. *New England Journal of Medicine*.
12. Piret J., Boivin G. Immunomodulatory strategies in herpesvirus infections. *Clinical Microbiology Reviews*.
13. Siegal F.P. Immune response in herpes simplex virus infections. *Immunology Today*.
14. Stanberry L.R., Rosenthal S.L. Herpes simplex virus vaccines. *Clinical Microbiology Reviews*.
15. Kroon S., Langeland N. Antiviral therapy in herpes simplex virus infections. *Scandinavian Journal of Infectious Diseases*.

CYTOKINE-MEDIATED SUPPRESSION OF
MEGAKARYOCYTOPOIESIS (TNF- α , IL-6, IL-1 β)

Abstract: Megakaryocytopoiesis is a complex, multistep process of megakaryocyte differentiation and maturation in the bone marrow, ensuring physiological platelet production. Disruptions of this process underlie various forms of thrombocytopenia, including inflammatory, autoimmune, and oncohematological disorders. Over the past decades, it has been established that proinflammatory cytokines, particularly tumor necrosis factor- α (TNF- α), interleukin-6 (IL-6), and interleukin-1 beta (IL-1 β), play a crucial role in the pathogenesis of megakaryocytopoietic suppression. These mediators affect both hematopoietic stem cells and committed megakaryocytic progenitors by modulating intracellular signaling pathways such as JAK/STAT, NF- κ B, and MAPK, as well as altering the expression of thrombopoietin and its receptor c-Mpl.

This literature review aims to systematize current data on the molecular mechanisms of cytokine-mediated inhibition of megakaryocytopoiesis, its role in the development of thrombocytopenia, and potential therapeutic strategies targeting inflammatory imbalance.

Key words: Megakaryocytopoiesis, thrombocytopenia, TNF- α , IL-6, IL-1 β , cytokines, inflammation, bone marrow, thrombopoietin, NF- κ B, JAK/STAT.

Introduction

Platelets are essential components of the hemostatic system, maintaining vascular integrity and participating in immune responses. Their production occurs in the bone marrow from megakaryocytes—highly specialized cells derived from hematopoietic stem cells (HSCs) through several intermediate stages. This process, known as megakaryocytopoiesis, is regulated by a complex interaction of growth factors, hormones, and cytokines [Kaushansky, 2015, p. 112].

Under physiological conditions, the primary regulator of megakaryocytopoiesis is thrombopoietin (TPO), which interacts with the c-Mpl receptor on megakaryocytes and their progenitors. However, during inflammatory, infectious, autoimmune, and oncological diseases, the bone marrow microenvironment becomes enriched with proinflammatory cytokines, including TNF- α , IL-6, and IL-1 β [Metcalf, 2017, p. 94].

These cytokines disrupt the balance between proliferation, differentiation, and apoptosis of megakaryocytes, leading to reduced platelet production and the

development of secondary thrombocytopenia [Harker, 2018, p. 301]. Clinically, this manifests as increased bleeding risk, hemorrhagic complications, and deterioration of disease prognosis.

The aim of this review is to analyze the mechanisms of cytokine-mediated suppression of megakaryocytopoiesis, with particular emphasis on the roles of TNF- α , IL-6, and IL-1 β .

Literature review

1. Physiology of Megakaryocytopoiesis

Megakaryocytes originate from HSCs through a megakaryoblast stage followed by endomitosis, resulting in nuclear polyploidy. This process enables high synthetic activity and platelet formation through cytoplasmic fragmentation [Italiano, 2016, p. 44].

Key regulatory factors include:

- Thrombopoietin (TPO)
- Stem cell factor (SCF)
- Interleukins IL-3 and IL-11

TPO activates the JAK2/STAT5 pathway, promoting megakaryocyte survival and maturation [Kaushansky, 2015, p. 118].

2. Inflammatory Cytokines and the Bone Marrow Niche

The bone marrow niche is a dynamic environment where stromal cells, endothelial cells, and immune cells create a cytokine-rich microenvironment. During inflammation, macrophages and T lymphocytes become activated, leading to increased production of TNF- α , IL-6, and IL-1 β [Murphy, 2019, p. 210].

These cytokines exert both systemic and local effects on hematopoiesis by altering gene expression related to differentiation and apoptosis.

3. Role of TNF- α in Megakaryocytopoietic Suppression

TNF- α is a key inflammatory mediator that activates the NF- κ B pathway. It can:

- Inhibit proliferation of megakaryocytic progenitors
- Induce megakaryocyte apoptosis
- Suppress c-Mpl receptor expression

Elevated TNF- α levels correlate with thrombocytopenia severity in rheumatoid arthritis and systemic lupus erythematosus [Zhou, 2020, p. 87]. Experimental models show that TNF- α reduces cellular responsiveness to TPO by blocking the JAK/STAT signaling pathway [Aggarwal, 2018, p. 152].

4. IL-6 and Megakaryocytic Differentiation

IL-6 exhibits a dual effect: at low concentrations, it may stimulate thrombopoiesis, whereas chronic elevation suppresses it [Scheller, 2014, p. 203].

IL-6 activates the STAT3 pathway, resulting in:

- Disruption of the proliferation–differentiation balance
- Induction of the acute-phase response
- Altered hepatic TPO expression

In chronic infections and malignancies, IL-6 is associated with functional megakaryocyte impairment [Hunter, 2015, p. 77].

5. IL-1 β and Inflammatory Regulation of Hematopoiesis

IL-1 β is a potent pyrogenic and proinflammatory cytokine that activates NF- κ B and MAPK pathways [Dinarello, 2018, p. 61].

In megakaryocytes, IL-1 β :

- Inhibits early differentiation stages
- Promotes apoptosis
- Alters interactions with bone marrow stroma

Elevated IL-1 β levels are observed in aplastic anemia and myelodysplastic syndromes [Young, 2019, p. 145].

6. Intracellular Signaling Pathways: NF- κ B, JAK/STAT, and MAPK

Proinflammatory cytokines activate key intracellular cascades:

Pathway	Biological Effect
NF- κ B	Inflammation, apoptosis
JAK/STAT	Altered differentiation
MAPK	Cellular stress response

Activation of these pathways disrupts the normal megakaryocyte cell cycle [O'Shea, 2017, p. 233].

7. Clinical Implications

Cytokine-mediated thrombocytopenia is observed in:

- Sepsis
- Autoimmune diseases
- Malignancies
- Chronic infections

Patients demonstrate reduced platelet counts, impaired platelet function, and increased bleeding risk [Harrison, 2021, p. 412].

RESULTS

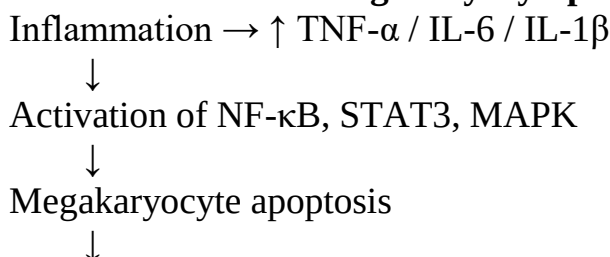
Table 1. Effects of Key Cytokines on Megakaryocytopoiesis

Cytokine	Primary Effect	Mechanism
TNF- α	Suppression	NF- κ B activation, apoptosis
IL-6	Dual	STAT3, acute-phase response
IL-1 β	Inhibition	MAPK activation, inflammation

Table 2. Diseases Associated with Cytokine-Mediated Thrombocytopenia

Disease	Main Cytokines	Clinical Features
Rheumatoid arthritis	TNF- α , IL-6	Thrombocytopenia
Sepsis	IL-1 β , TNF- α	Bleeding
MDS	IL-1 β	Cytopenias

Scheme 1. Mechanism of Megakaryocytopoietic Suppression



↓ Platelet production

Scheme 2. Interaction Between Cytokines and TPO

TPO → c-Mpl → JAK2/STAT5 → Megakaryocyte maturation

↑

TNF- α / IL-6 inhibit signaling

Discussion

The reviewed data indicate that proinflammatory cytokines play a central role in the pathogenesis of secondary thrombocytopenia. Their effects are mediated through both direct action on megakaryocytes and modification of the bone marrow niche [Metcalf, 2017, p. 101].

TNF- α appears to exert the strongest inhibitory influence. TNF- α inhibitors such as infliximab and adalimumab have been shown to partially restore thrombopoiesis in patients with autoimmune diseases [Zhou, 2020, p. 92].

IL-6 inhibitors, including tocilizumab, also show promise in correcting cytokine imbalance [Scheller, 2014, p. 211]. However, the risk of immunosuppression and infectious complications must be considered.

Conclusion

Cytokine-mediated suppression of megakaryocytopoiesis is a key pathogenic mechanism underlying thrombocytopenia in inflammatory and autoimmune diseases. TNF- α , IL-6, and IL-1 β disrupt signaling pathways responsible for megakaryocyte maturation, leading to reduced platelet production.

Understanding these mechanisms provides a foundation for targeted therapeutic strategies aimed at restoring hematopoiesis and improving clinical outcomes.

REFERENCES (Alphabetical Order)

1. Aggarwal B. (2018). *TNF signaling in inflammation*. Springer, pp. 150–160.
2. Dinarello C. (2018). *Interleukin-1 in disease*. N Engl J Med, 378:58–65.
3. Harrison C. (2021). *Platelet disorders*. Blood Rev, 35:400–420.
4. Harker L. (2018). *Thrombocytopenia mechanisms*. Hematology, 23:295–305.
5. Hunter C. (2015). *IL-6 biology*. Immunol Rev, 267:72–85.
6. Italiano J. (2016). *Megakaryocyte biology*. Nat Rev Mol Cell Biol, 17:34–45.
7. Kaushansky K. (2015). *Thrombopoiesis*. Blood, 126:110–120.
8. Metcalf D. (2017). *Hematopoietic cytokines*. Nat Rev Immunol, 17:90–102.
9. Murphy K. (2019). *Janeway's Immunobiology*. Garland, pp. 205–215.
10. O'Shea J. (2017). *JAK-STAT signaling*. N Engl J Med, 377:230–242.
11. Scheller J. (2014). *IL-6 in inflammation*. Cytokine Growth Factor Rev, 25:201–214.
12. Young N. (2019). *Aplastic anemia*. Blood, 133:135–150.
13. Zhou L. (2020). *TNF- α and thrombocytopenia*. Autoimmun Rev, 19:80–95.
14. Hsieh M. (2016). *Bone marrow niche*. Cell Stem Cell, 18:150–160.
15. Vainchenker W. (2017). *Megakaryocyte differentiation*. Blood, 129:163–172.

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TRANSCHEGARAVIY EKOLOGIK MUAMMOLAR: OROL DENGIZI INQIROZI VA CHO'LLANISH JARAYONI

Annotatsiya: Ushbu ilmiy maqolada Markaziy Osiyodagi eng yirik transchegaraviy ekologik muammolardan biri hisoblangan Orol dengizi inqirozi va uning bilan chambarchas bog'liq cho'llanish jarayoni keng qamrovli geografik, ijtimoiy, ekologik va iqtisodiy tahlil asosida yoritiladi. Maqolada Orol inqirozining tabiiy va antropogen kelib chiqish omillari, transchegaraviy ekologik oqibatlari, cho'llanish jarayonining hududiy dinamikasi, aholi salomatligiga ta'siri, xalqaro tashkilotlar tomonidan amalga oshirilayotgan loyihalar hamda mintaqaviy barqarorlik uchun zarur strategiyalar keng yoritiladi.

Kalit so'zlar: Orol dengizi, transchegaraviy ekologik muammolar, cho'llanish, Aralbo'yi, ekologik inqiroz, suv resurslarini boshqarish, Orolqum cho'li, tuz-chang bo'ronlari, global ekologik xavfsizlik.

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TRANSBORDER ECOLOGICAL PROBLEMS: THE ARAL SEA CRISIS AND DESERTIFICATION PROCESS

Abstract: This scientific article discusses the Aral Sea crisis, one of the largest transboundary environmental problems in Central Asia, and the closely related desertification process, based on a comprehensive geographical, social, ecological and economic analysis. The article comprehensively discusses the natural and anthropogenic factors of the Aral Sea crisis, transboundary environmental consequences, regional dynamics of the desertification process, impact on public health, projects implemented by international organizations, and strategies necessary for regional stability.

Keywords: Aral Sea, transboundary environmental problems, desertification, Aral Sea, ecological crisis, water resources management, Aral Sea desert, salt and dust storms, global environmental security.

Kirish: Transchegaraviy ekologik muammolar bugungi kunda dunyoning ko‘plab mintaqalarida ekologik barqarorlikka jiddiy tahdid tug‘dirayotgan globallashuv davrining dolzarb masalalaridan biridir. Markaziy Osiyoda eng yirik bunday muammo — Orol dengizi inqirozi bo‘lib, u geografik miqyosda nafaqat mintaqaviy, balki global ekologik fojia sifatida tan olingan. Orol dengizining maydoni 1960-yillarda 68 ming km² bo‘lgan bo‘lsa, bugungi kunga kelib uning 10 foizga yaqin qismi saqlanib qolgan xolos. Yillik suv kirimi 50–60 km³ dan 5–7 km³ gacha kamaygan.

Orol dengizi inqirozi va cho‘llanish jarayoni XX asrning eng yirik ekologik falokatlaridan biri hisoblanadi. Orol dengizi Markaziy Osiyoda joylashgan yopiq suv havzasi bo‘lib, u asosan Amudaryo va Sirdaryo daryolari hisobiga to‘yinib kelgan, mintqa iqlimini mo‘tadillashtirgan va boy tabiiy-biologik resurslarga ega bo‘lgan. Biroq 1960-yillardan boshlab sobiq Ittifoq davrida qishloq xo‘jaligini, ayniqsa paxtachilikni jadal rivojlantirish maqsadida daryo suvlarining katta qismi sun‘iy sug‘orish tizimlariga yo‘naltirildi, natijada Orol dengiziga quyiladigan suv hajmi keskin kamaydi va dengiz sathi tez sur‘atlarda pasaya boshladi. Suv resurslaridan ilmiy asoslanmagan va samarasiz foydalanish, ochiq kanallar orqali katta miqdorda suvning bug‘lanib ketishi hamda suv xo‘jaligini boshqarishdagi xatolar dengizning qisqarishini yanada jadallashtirdi.

Orol dengizining qurishi natijasida uning tubi ochilib, millionlab gektar maydonda yangi cho‘l — Orolqum shakllandi va bu hudud cho‘llanish jarayonining yaqqol namunasiga aylandi. Cho‘llanish jarayoni dengiz tubida to‘plangan tuz va kimyoviy moddalarning shamol yordamida atrof-muhitga tarqalishi bilan kuchaydi, buning oqibatida tuproqlar sho‘rlanib, o‘simlik qoplami keskin kamaydi va tabiiy ekotizimlar izdan chiqdi. Shuningdek, suvning yo‘qolishi mintaqaviy iqlimga salbiy ta‘sir ko‘rsatib, yozda haroratning haddan tashqari ko‘tarilishi, qishda esa sovuqning kuchayishi kuzatila boshladi, bu holat esa qurg‘oqchilik va eroziya jarayonlarini tezlashtirdi.

Mutaxassislar Orol inqirozini XX asrning eng yirik ekologik falokati sifatida baholaydi (UNEP, 2020; UNDP, 2022). Dengizning qurishi bilan birga yangi cho‘l Orolqum paydo bo‘ldi. Mazkur hudud 5 million gektardan ortiq ochiq tuzli maydon bo‘lib, yiliga millionlab tonna zararli chang va tuz aerozollarini atmosferaga ko‘taradi.

Cho‘llanish jarayonining mintaqaviy kuchayishi esa O‘zbekiston, Qozog‘iston, Turkmaniston, hatto Rossiya va Xitoy hududlariga qadar yetib boruvchi ekologik oqibatlarga olib kelmoqda. Ushbu maqola aynan Orol dengizi inqirozi va cho‘llanish jarayonining transchegaraviy mazmuni, ekologik xavf darajasi, hududiy dinamikasi va mintaqaviy barqarorlikka ta‘sirini ilmiy asosda tahlil qiladi.

1960–1990-yillar oralig‘ida Amudaryo va Sirdaryo havzalarida paxta va guruch yetishtirish hajmini keskin oshirish bo‘yicha siyosat yuritildi. Natijada: Daryolardan olinayotgan suv hajmi 2–3 barobar ko‘paydi. Kanallarning 50% dan ortig‘i betonlanmagan bo‘lib, suvning bug‘lanish yo‘qotishlari 25–30% ni tashkil

etdi. Meliorativ tizimlar eskirgan bo'lib, drenaj suvlarining qayta dengizga tushishi keskin kamaydi.

Bu jarayonlar natijasida dengizga oqib kelayotgan suv miqdori 90% ga kamaydi. Arid iqlim sharoiti Orol havzasida suv tanqisligi xavfini keskin kuchaytiradi: Yillik bug'lanish 1000–1200 mm. Yog'ingarchilik miqdori 80–120 mm. Yozgi harorat +45°C gacha ko'tariladi. Shu sababli Orolni tiklashda faqat tabiiy jarayonlarga tayanish mutlaqo samarasiz bo'lar edi.

Orol qurishi natijasida maydoni 5 mln gektardan oshgan yangi cho'l — Orolqum hosil bo'ldi. Bu yerlarning tuprog'i, yuqori darajada sho'r, fenollar, pestitsidlar, og'ir metallarga boy, shamol eroziyasiga juda moyil. **Bioxilma-xillikning keskin qisqarishi**, 60-yillarda 30 dan ortiq baliq turi mavjud edi, hozir esa faqat bir nechta tur Shimoliy Orolga qayta kiritilgan. Qushlar, sutemizuvchilar turlarining 70% ga yaqini yo'qolgan. Har yili atmosfera qatlamiga **75–100 mln tonna** tuz va chang ko'tariladi. Qozog'istonning janubiy viloyatlariga, O'zbekistonning butun shimoli-g'arbiy qismiga, Turkmanistonning shimoliga, hatto ba'zi yillarda Rossiya va Xitoygacha yetib boradi. Bu uning **global ekologik muammo** sifatida tan olinishiga sabab bo'lgan.

Orolbo'yida ekologik vaziyatning keskinlashuvi inson salomatligiga jiddiy ta'sir ko'rsatdi: Nafas olish tizimi kasalliklari 3 barobar oshgan. Onkologik kasalliklar, qalqonsimon bez kasalliklari yuqori ko'rsatkichda. Ichimlik suvi tanqisligi qishloqlarda sanitariya sharoitlarini yomonlashtirdi. Aholining migratsiyasi keskinlashdi – 1990 – 2020 yillarda 1 mln ga yaqin aholi hududni tark etgan.

Cho'llanish quyidagi hududlarga sezilarli ta'sir ko'rsatmoqda: Qoraqalpog'iston Respublikasi — eng katta zarar ko'rgan hudud. Xorazm va Qashqadaryo viloyatlari — sho'rlanish kuchaygan. Qozog'istonning Qizilorda viloyati — Orolning shimoliy qismini to'liq qamrab olgan. Shamol orqali ko'tarilgan chang-tuzlar Turkmaniston va hatto Xitoyning Shinjon hududigacha yetadi.

1993 yildan buyon O'zbekiston, Qozog'iston, Turkmaniston, Qirg'iziston va Tojikiston mavjud suv resurslarini boshqarish bo'yicha qo'shma siyosat yuritmoqda. IFAS loyihalari: suvni monitoring qilish, orolbo'yida yashil hududlarni kengaytirish, ijtimoiy infratuzilmani rivojlantirish, aholi sog'lig'ini himoya qilishga yo'naltirilgan.

Qozog'istonning “Kokaral to'g'oni” loyihasi dengizning bir qismini tiklashga yordam berdi: Suv sathi 4–6 metr ga ko'tarildi. Bioxilma-xillik tiklana boshladi. Baliqchilik qayta rivojlanmoqda. Bu tajriba janubiy Orolni qisman tiklash uchun ilmiy-amaliy model bo'lishi mumkin.

2021 yildan Orolbo'yi hududi BMT tomonidan “Global ekologik innovatsiyalar hududi” deb e'lon qilingan. Bu xalqaro grantlar, innovatsion ekologik texnologiyalar, cho'llanishga qarshi kurash bo'yicha tajribalar kirib kelishini tezlashtirdi.

Xulosa: Orol dengizi inqirozi Markaziy Osiyoda sodir bo'lgan eng yirik ekologik falokat bo'lib, uning oqibatlari tabiat, aholi salomatligi, iqtisodiyot, iqlim,

suv resurslari va geosiyosiy barqarorlikka jiddiy zarar yetkazmoqda. Dengizning qurishi bilan bog'liq cho'llanish jarayoni mintaqani ekologik halokat zonasi darajasiga yetkazdi. Tadqiqot shuni ko'rsatadiki, Orol muammosini hal qilish uchun faqat milliy emas, balki mintaqaviy va global hamkorlik, zamonaviy ilmiy yondashuv, ekologik ta'lim va suv resurslarini ongli boshqarish muhim ahamiyatga ega. Taklif va tavsiyalar

1. Suv resurslarini boshqarishni optimallashtirish: Suv tejavchi texnologiyalarni majburiy joriy etish. Tomchilatib sug'orishni kengaytirish. Suvning yo'qolishini kamaytiruvchi muqobil texnologiyalarni qo'llash.

2. Cho'llanishga qarshi kurash choralari kengaytirish: Orolqumda saksovul ekinlarini 2–3 baravar kengaytirish. Sho'rlangan yerlarda fitomelioratsiya usullarini qo'llash. Deflatsiyaga qarshi himoya polosalari yaratish.

3. Ekologik monitoring tizimini kuchaytirish: GIS va masofadan zondlash tizimlari orqali muntazam kuzatuv. Transchegaraviy atmosfera monitoringi uchun Markaziy Osiyoda yagona ma'lumot markazi yaratish.

4. Aholi salomatligini himoya qilish: Ekologik xavfli hududlarda mobil tibbiy markazlar ochish. Ichimlik suvini tozalash tizimlarini modernizatsiya qilish.

5. Xalqaro hamkorlikni kengaytirish: IFAS faoliyatini modernizatsiya qilish. Qozog'istonning Kichik Orol tajribasini O'zbekiston hududida tatbiq etish. BMT, Jahon banki va Yevropa Ittifoqi bilan qo'shma loyihalar hajmini oshirish.

Adabiyotlar ro'yxati

1. Suyunov, A., et al. "Ecological and geographical aspects of land use in forming agrolandscapes (in the example of Kashkadarya region)." 2350-0328.
2. Usmanova R., Khushmurodov F. Socio-economic and ecological problems of the use of irradiated lands //IUSER Ekonomika i sotsium mejdunarodnyy nauchno-praktichekiy zhurnal. – №. 3. – С. 94.
3. Qurbonov P. R., Qo'ldosheva G. M. Ecological-geographical problems in the residential areas of kashkadarya region //Экономика и социум. – 2025. – №. 5-1 (132). – С. 617-619.
4. Fayzullo o'g'li S. F. Transchegaraviy suv resurslarida sun'iy intellektdan foydalanish: markaziy osiyoda raqamli boshqaruv imkoniyatlari va muammolari //Лучшие интеллектуальные исследования. – 2025. – Т. 58. – №. 5. – С. 318-325.
5. Omonullayev O. H. Qashqadaryo viloyatida erkin iqtisodiy zonalar faoliyatini takomillashtirishning hududiy jihatlari//Экономика и социум. – 2025. – №. 6-2 (133). – С. 653-658.

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LASTIK TO'QIMASI ASOSIDA OLINGAN YANGI TUZILISHDAGI PALTOBOP TRIKOTAJ TO'QIMALARINING FIZIK-MEXANIK XUSUSIYATLARI TAHLILI

Annotatsiya. Ushbu maqolada Yangi tuzilishli paltobop lastik trikotaj to'qimalarining hom ashyo tarkibi 56x3tex va 56 tex poliakrilonitril ipidan tashkil topgan 4 ta varianti ishlab va trikotaj to'qimalarining fizik-mexanik ko'rsatkichlari "KOR-UZ" texnoparki qoshidagi sinov laboratoriyasida mavjud sinov asboblari yordamida standartda keltirilgan uslublar bo'yicha tajribadan o'tkazildi. Fizik-mexanik ko'rsatkichlari bo'yicha esa, aksincha III variantning qiymatlari yuqoriligi tahlillar natijasida ma'lum bo'ldi.

Kalit so'zlar: To'qima, trikotaj, lastik, kompleks baholash, fizik-mexanik, mashina klassi, chiziqli zichlik.

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ANALYSIS OF THE PHYSICAL AND MECHANICAL PROPERTIES OF COAT KNITTED WORKS OF A NEW STRUCTURE OBTAINED ON THE BASIS OF LASTIC TISSUE

Abstract. In this article, 4 variants of new-structure coat elastic knitted fabrics with raw material composition consisting of 56x3tex and 56tex polyacrylonitrile threads were developed, and the physical and mechanical indicators of knitted fabrics were tested using existing testing equipment in the testing laboratory of the "KOR-UZ" technopark according to the methods given in

the standard. In terms of physical and mechanical indicators, on the contrary, as a result of the analysis, it became known that the values of variant III are higher.

Keywords: Weaving, knitwear, elastic, complex evaluation, physical-mechanical, machine class, linear density.

To'qimachilik sanoatining boshqaruvini klaster tizimiga o'tkazilishi, mahalliy hom ashyolarni chuqur qayta ishlash, yangi texnika va texnologiyalardan to'g'ri foydalanish, hom ashyo sarfini tejash kabi bir qancha omillar bunga asosiy sabab bo'ldi. Ushbu omillar albatta to'qimachilik sanoatida yangi to'qima turlarini yaratish, assortiment turlarini kengaytirish, mavsumga mos kiyim-kechaklar bilan ta'minlash kabi ustuvor vazifalarni soha oldiga muammo etib qo'yadi. Buning uchun albatta yuqori sifat ko'rsatkichlariga ega, xomashyo sarfi kam bo'lgan trikotaj to'qimalarini ishlab chiqarishga bo'lgan ehtiyojni yuzaga keltiradi [1-3].

Paltobop trikotaj to'qimalarining asosiy fizik-mexanik xususiyatlari ulardan foydalanish chegarasini belgilovchi tavsiflar xisoblanadi.

Fizik-mexanik xususiyatlarni tavsiflovchi ko'rsatkichlar qatoriga mustahkamlik, uzilish kuchidan kam bo'lgan kuchlanish berilganda cho'ziluvchanlik, bir martali va takroriy deformatsiyaga chidamlilik, havo o'tkazuvchanlik va ishqalanishga chidamlilik, namlab-iissiqlatib ishlov

berilgandan so'ng kirishish kabilar qabul qilingan. Shuningdek, yuza yoki uzunlik birligiga nisbatan nuqsonlar miqdori va ro'yhati trikotaj matolarining tashqi ko'rinishini tavsiflovchi ko'rsatkichlar hisoblanadi [4-5].

Namunalarning fizik-mexanik ko'rsatkichlari tahlili 12 klassda ishlab chiqarilgan namunalar uchun 1-jadvalda keltirilgan.

1-jadval.

Lastik to'qimasi asosida olingan yangi tuzilishdagi paltobop trikotaj to'qimalarining fizik-mexanik hususiyatlari (12 klass)

Ko'rsatkichlar		Variantlar				GOST bo'yicha
		I	II	III	IV	
Iplarni turi, chiziqli zichliklari		PAN 56 tex, 100%				
Trikotaj yuza zichligi Ms (gr/m ²)		648,3	919,2	1134	1253,4	Davlatlataro GOST. 28554-90
Trikotaj qalinligi T (mm)		1,6	1,8	2,1	2,55	
Hajm zichligi δ (mg/sm ³)		405,2	510,7	540	491,5	
Havo o'tkazuvchanlik V (sm ³ /sm ² ·sek)		58,4	52,6	48,8	45,6	GOST25295-2003 20-50 dm ³ /m ² ·sek
Ishq. chidam. I (ming ayl.)		35	38	48	57	GOST 16483-23 30- 60 ming va yuqori
Uzilish kuchi R (N)	Bo'yi bo'yicha	560	705	720	950	GOST 28554-22 80N dan kam emas
	Eni bo'yicha	260	580	1021	1080	
Uzilishgacha cho'zilish L (%)	Bo'yi bo'yicha	25	24	19	17	GOST 28554-90 I-0-40% II-41-100% III-100% dan yuq.
	Eni bo'yicha	63	60	45	42	
6N da cho'zilish, %	Eni bo'yicha	22	19	17	14	
	Bo'yi bo'yicha	12	10	9	7	

Qaytmas deformatsiya ε_n (%)	Eni bo'yicha	10	8	8	7	GOST 28882-20 15-20% dan ko'p emas
Qaytar deformatsiya ε_o (%)	Bo'yi bo'yicha	88	90	91	93	
	Eni bo'yicha	90	92	92	93	
Matoni kirishishi K (%)	Bo'yi bo'yicha	2	0	-1	-1	GOST 26667-85 6-8% ko'p emas
	Eni bo'yicha	4	1	-2	-2	8-10% ko'p emas
Pillinglanish, P, dona		4	3	2	2	GOST 30385-23 25 pildan ko'p bo'lmagan
Issiqlik saqllovchanlik R, %		29	32	46	51	GOST 25295-03 40% kam emas

Belgilangan ko'rsatkichlar foydalandigan xomashyo xususiyati va trikotaj to'qimalarini olish usuliga bog'liq bo'ladi. Barcha turdagi matolar sifatini tavsiflash uchun yuqorida keltirilgan sifat ko'rsatkichlarini qabul qilish shart emas [6].

Paltobop trikotaj to'qimalarini fizik-mexanik xususiyatlari tadqiqot natijalari tahlilidan ma'lum bo'ldiki, bunda olish usuli va tuzilishida qatorlar sonini to'qima rapportiga qo'shilishi, kimyoviy xomashyodan foydalanilishi va qatorlar orasini halqalar bilan to'ldirilishi hisobiga trikotajni bo'yi va eni bo'yicha mustaxkamliklarini 24,3%dan 70,5%ga, issiqlik o'tishiga ko'rsatiladigan qarshilikni 22,7%, ishqalanishga chidamlilik ko'rsatkichini 33,4%ga, deformatsiya ko'rsatkichlarini 5,2% ga ortishi, havo o'tkazuvchanligini 32,7% ga, uzilishdagi uzayish va kirishuvchanlik xususiyatlarini 53,8%dan 59%gacha, pillinglanish 60%ga kamayishga erishish mumkinligi isbotlandi. Buning natijasida yangi tuzilishli paltobop lastik trikotaj to'qimalarining sifat ko'rsatkichlarini yaxshilashga erishildi.

Foydalanilgan adabiyotlar :

1. Allamuratova T.K., Mukimov M. M. Investigation of technological parameters and physic-mechanical properties of an inlay knitted fabric on the base of doublelayer stitch. // International Journal of Advanced Research in Science, Engineering and Technology, India. Vol. 5, Issue 2, February 2018, p.p. 5136-5141.
2. Алламуратова Т.К., Мукимов М.М., Холиков К.М. Уменьшение материалоемкости за счет введения в структуру двухслойного трикотажа уточной нити, Научно-технический журнал ФерПИИ, 2018. Том 22. №2, -с. 49-52.
3. Allamuratova T.K., Mukimov M.M. Development of Efficient Constructive Diagram and Justification of Parameters When Shrinking Knitted Clothing on a Double-Functional Circular Machines // International Journal of Advanced Research in Science, Engineering and Technology, India. Vol. 5, Issue 10, October 2018. p.p. 7178-7185.
4. Алламуратова Т.К., Мукимов М.М., Холиков К.М. Новая конструкция

язычковых игл. Научно-технический журнал ФерПИ, 2018. Том 22. № 4, -с. 185-188.

5. М.М.Сагдиев, М.М.Муқимов, М.М.Мусаева. “Янги тузилишдаги пальтобоп ластик трикотаж тўқималарининг иссиқлик сақлаш хусусиятлари таҳлили” Italian International Scientific Online Conference: «Science and innovation in the education system». A collection of articles by Central Asian scholars Issue 9, Part 1, 9-13-pages.

6. М.М.Сагдиев, М.М.Муқимов, Н.М.Мусаев, М.М.Мусаева. “Янги тузилишдаги пальтобоп ластик трикотаж тўқималарини технологик кўрсаткичлари таҳлили” american International Scientific Online Conference: «Academic research in modern science». A collection of articles by Central Asian scholars Issue 41, Part 2, 14- 20-pages.

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LASTIK TO'QIMASI ASOSIDA OLINGAN YANGI TUZILISHDAGI PALTOBOP TRIKOTAJ TO'QIMALARINING TEXNOLOGIK KO'RSATKICHLARINI TAHLILI

Annotatsiya. Ushbu maqolada Tadqiqotlar davomida mashina klassi, to'qima tuzilishi, rapporti va ip qalinligi o'zgarishini texnologik ko'rsatkichlariga ta'siri tadqiq etildi. Hom ashyo tarkibi 56 tex x 3 va 56 tex poliakrilonitril ipidan tashkil topgan paltobop trikotaj to'qimalarining 4 ta varianti 7 va 12 klass yassi ikki ignadonli to'quv mashinasida ishlab chiqarildi.

Kalit so'zlar: To'qima, trikotaj, lastik, texnologik parametr, akril, mashina klassi, chiziqli zichlik.

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ANALYSIS OF THE TECHNOLOGICAL PARAMETERS OF COAT KNITTED FABRICS OF A NEW STRUCTURE BASED ON ELASTIC FABRIC

Abstract. In this article, the influence of changes in machine class, fabric structure, repeat, and yarn thickness on technological indicators was investigated. 4 variants of coat knitted fabrics, consisting of 56 tex x 3 and 56 tex polyacrylonitrile yarn, were produced on a flat two-bed knitting machine of classes 7 and 12.

Keywords: Fabric, knitwear, elastic, technological parameter, acrylic, machine class, linear density.

Matoning ishlab chiqarishda asosiy talab sifatni, ishlab chiqarish unumdorligini oshirish, resurslarni tejash, hamda mahsulot assortimentini yaxshilash va yangilashdir. Trikotaj ishlab chiqarishining o'ziga xos afzalliklari mavjud bo'lib, bu sohaning kelajakda yanada rivojlanishiga keng imkoniyatlar yaratadi. Jumladan:

-mahsulotning keng assortimenti, turli to'quv usullari yordamida trikotajga turli tashqi ko'rinishlar va xususiyatlar berish imkoniyatlari, tayyor mahsulotga mos keladigan yoki unga yaqin yarim tayyor mahsulotni ishlab chiqarish imkoniyati;

-trikotajning iste'mol xususiyatlariga qulayligi va deyarli barcha to'qimachilik xomashyolarini qayta ishlash imkoniyati.

-trikotaj ishlab chiqarishining yuqori texnik-iqtisodiy ko'rsatkichlari, bu avvalo trikotaj mashinalarining yuqori ishlab chiqarish unumdorligi bilan izohlanadi. Bundan tashqari, trikotaj ishlab chiqarishining texnologik jarayoni to'qimachilikka qaraganda qisqaroq va arzonroqdir [1-2].

Tadqiqotlar davomida mashina klassi, to'qima tuzilishi, rapporti va ip qalinligi o'zgarishini texnologik ko'rsatkichlariga ta'siri tadqiq etildi. Hom ashyo tarkibi 56 tex x 3 poliakrilonitril ipidan tashkil topgan paltobop trikotaj to'qimalarining 4 ta varianti 7 va 12 klass yassi ikki ignadonli to'quv mashinasida ishlab chiqarildi [3-6]. Paltobop trikotaj to'qimalarining texnologik ko'rsatkichlari "KOR-UZ" texnoparki sinov laboratoriyasida standart uslubda aniqlanib, natijalar 1 va 2-jadvalda keltirildi. Namunalarning texnologik ko'rsatkichlari tahlili 7 klassda ishlab chiqarilgan namunalar uchun keltirilgan.

1-jadval.

Lastik to'qimasi asosida olingan yangi tuzilishdagi paltobop trikotaj to'qimalarining texnologik ko'rsatkichlari (7-klass)

Ko'rsatkichlar	Variantlar			
	I	II	III	IV
Iplarni turi, chiziqli zichliklari va matodagi % miqdori	PAN ipi 56 x 3 tex			
Halqa qadami A, mm	2,38	2,94	2,77	2,8
Halqa qatori balandligi V, mm	1,92	1,78	1,9	2
Gorizontal bo'yicha zichlik R_g	21	17	18	18
Vertikal bo'yicha zichlik R_v	26	28	26	25
Xalqa ipi uzunligi L, mm	8,3	12,6	15,5	20,6
Trikotajning yuza zichligi M_s , gr/m ²	804,7	1085	1098	1442
Trikotajning qalinligi T, mm	3,6	4,3	4,9	5,6
Hajm zichligi δ , mg/cm ³	223,5	252,3	224,1	257,5

2-jadval.

Lastik to'qimasi asosida olingan yangi tuzilishdagi paltobop trikotaj to'qimalarining texnologik ko'rsatkichlari (12 klass)

Ko'rsatkichlar	Variantlar			
	I	II	III	IV
Iplarni turi, chiziqli zichliklari va matodagi % miqdori	PAN 56 tex			
Halqa qadami A, mm	2,08	1,32	1,32	1,39
Halqa qatori balandligi V, mm	1,47	1,56	1,67	1,67
Gorizontal bo'yicha zichlik R_g	24	38	38	36
Vertikal bo'yicha zichlik R_v	34	32	30	30
Xalqa ipi uzunligi L, mm	5,4	7,8	8,6	10,5
Trikotajning yuza zichligi M_s , gr/m ²	648,3	919,2	1134	1253,4
Trikotajning qalinligi T, mm	1,6	1,8	2,1	2,55
Hajm zichligi δ , mg/cm ³	405,2	510,7	540	491,5

Paltobop trikotaj namunalarining qalinlik ko'rsatkichi tadqiq etilganda 3,6 mm dan 5,6 mm gacha oraliqda o'zgardi. Eng kichik qalinlik birinchi variant to'qimasida kuzatilgan bo'lsa, eng katta ko'rsatkich IV variantda qayd etildi. Barcha variantlarning qalinlik ko'rsatkichlari birinchi variant to'qimasidan mos ravishda 16,2%, 26,5% va 35,7% ga yuqoriligi kuzatildi. Bu namunalarning rapporti va tuzilishini o'zgarishi bilan asoslanadi.

Natijada, to'qima namunalari ichida qolgan variantlarga nisbatan birinchi variant to'qimasining homashyo sarfi mos ravishda 0,27% dan 15,2% gacha kamaygani aniqlandi. Tadqiqotlar oxirida paltobop trikotaj to'qimalarining texnologik ko'rsatkichlarini yaxshilash va assortiment turlarini kengaytirish maqsadida yuqori klass trikotaj mashinalarida ham namunalar olish texnologiyasini ishlab chiqish tavsiya etildi.

Foydalanilgan adabiyotlar :

1. Сагдиев М.М., Мукимов М.М., Мусаева М.М., "Пальтобоп трикотаж тўқималарининг технологик кўрсаткичлари тадқиқи" "innovative achievements in science 2024" a collection scientific works of the International scientific conference (27th March, 2024) – Chelyabinsk, Russia. 138-141p.
2. М.М.Сагдиев, М.М.Мусаева, Ш. Шойимов, "Янги турдаги ластик трикотаж тўқималарининг технологик кўрсаткичлари тадқиқи" "Soha korxonolari uchun yuqori malakali kadrlar tayyorlashda dual ta'limning o'rni hamda fan, ta'lim, ishlab chiqarish klasterlarini rivojlantirishda innovatsion yondoshuvlar" mavzusiga bag'ishlangan xalqaro ilmiy-amaliy anjumani. 2023 yil 204-207-bet.
3. Matković V. M. P. The power of fashion: The influence of knitting design on the development of knitting technology //Textile. – 2010. – T. 8. – №. 2. – С. 122-146
4. <https://star-tex.ru/article/paltovye-tkani-vidy-sostav-kak-vybrat>

5. Textilepedia (The Textile Bible) — кичик энциклопедия, дизайнерлар ва тўқимачилар учун қўлланма.

6. Fabric technical datasheets — йирик мато ишлаб чиқарувчилар (масалан, Toray, Klopman, Carrington) томонидан эълон қилинадиган техник паспорт.

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APPLICATION OF SEBIDIN IN THE PREVENTION OF PERIODONTITIS IN ADOLESCENTS

Abstract : *Periodontal diseases remain one of the most common dental problems among adolescents. Hormonal changes during puberty, insufficient oral hygiene, and decreased local immune resistance contribute to the early development of inflammatory periodontal conditions. Prevention of periodontitis at this age is therefore of particular importance in order to avoid chronic forms of the disease in adulthood.*

The present study evaluates the effectiveness of the antiseptic drug Sebidin in the prevention of periodontitis in adolescents aged 12–16 years. A total of 60 adolescents participated in the study and were divided into a main group and a control group. The main group received standard oral hygiene measures combined with Sebidin, while the control group followed only conventional hygiene recommendations.

Clinical assessment included gingival index, plaque index, bleeding tendency, and subjective complaints. The results demonstrated a significant reduction in gingival inflammation, plaque accumulation, and bleeding in the main group compared to the control group ($p < 0.05$). No adverse reactions were observed during the study period.

The findings indicate that Sebidin is a safe and effective agent for the prevention of periodontal diseases in adolescents and can be recommended for use in preventive dental practice.

Keywords: *adolescents, periodontitis prevention, Sebidin, oral hygiene, periodontal diseases.*

Introduction

Periodontal diseases are among the most common dental pathologies in adolescents and represent a significant public health problem worldwide. According to epidemiological studies, inflammatory periodontal conditions such as gingivitis and early-stage periodontitis are frequently diagnosed in children and adolescents aged 12–16 years. If left untreated, these conditions may progress into chronic periodontitis, leading to irreversible destruction of periodontal tissues and premature tooth loss in adulthood.

Adolescence is characterized by profound physiological and hormonal changes that significantly affect periodontal tissues. Increased levels of sex hormones during puberty enhance vascular permeability of gingival tissues and alter immune responses, creating favorable conditions for microbial colonization and inflammation. In addition, insufficient oral hygiene, irregular dental visits, unhealthy dietary habits, and low awareness of preventive measures further increase the risk of periodontal diseases in this age group.

The pathogenesis of periodontitis is closely associated with the accumulation of dental plaque and the formation of pathogenic biofilms composed of anaerobic and facultative anaerobic microorganisms. These microorganisms trigger inflammatory cascades, stimulate the production of pro-inflammatory cytokines, and contribute to the destruction of gingival and periodontal structures. Therefore, effective prevention strategies aimed at reducing microbial load and controlling inflammation are essential.

Antiseptic agents play a crucial role in preventive dentistry by suppressing pathogenic microflora and maintaining oral microbial balance. Sebidin, which contains active antiseptic components such as chlorhexidine and hexetidine, exhibits broad-spectrum antimicrobial activity and prolonged local effects. Its ease of use, safety profile, and proven efficacy make Sebidin a promising agent for the prevention of periodontal diseases in adolescents.

Materials and Methods

This clinical observational study included 60 adolescents aged 12–16 years who underwent dental examination and periodontal assessment. All participants were somatically healthy and presented with mild to moderate signs of gingival inflammation without advanced periodontal destruction.

Inclusion criteria

- Presence of mild or moderate gingivitis;
- Poor or moderate oral hygiene status;
- Absence of systemic diseases affecting periodontal tissues;
- Written informed consent obtained from parents or guardians.

Participants were divided into two groups:

• **Main group (n = 30):** standard oral hygiene measures combined with Sebidin administration;

• **Control group (n = 30):** standard oral hygiene measures only.

Sebidin lozenges were administered to the main group twice daily after meals for 10 consecutive days. Participants were instructed to slowly dissolve the lozenge in the oral cavity and avoid eating or drinking for 30 minutes after use.

Clinical evaluation was performed at baseline and after the intervention using the following parameters:

- Gingival Index (GI);
- Plaque Index (PI);
- Gingival bleeding tendency;
- Subjective symptoms (pain, swelling, discomfort, halitosis).

Statistical analysis was conducted using standard methods, and differences were considered significant at $p < 0.05$.

Results

At the end of the study, adolescents in the main group demonstrated significant clinical improvement in periodontal status compared to baseline values and the control group. Gingival inflammation, hyperemia, and edema were markedly reduced in participants receiving Sebidin.

The mean Gingival Index decreased by approximately 1.8–2.0 times in the main group, indicating a substantial reduction in inflammatory activity. The Plaque Index also showed a statistically significant decrease ($p < 0.05$), reflecting effective suppression of dental plaque formation and microbial biofilm.

Gingival bleeding was reduced by 70–75% in the main group, while only minor changes were observed in the control group. Subjective complaints such as gingival pain, discomfort, and unpleasant oral odor were significantly less frequent among adolescents treated with Sebidin.

No adverse effects, allergic reactions, or intolerance to the drug were observed throughout the study period, confirming its safety for use in adolescents.

Discussion

The results of this study confirm the high preventive efficacy of Sebidin in adolescents with inflammatory periodontal conditions. The antiseptic components of Sebidin effectively reduce the microbial load in the oral cavity, inhibit biofilm formation, and suppress inflammatory processes in gingival tissues.

Early preventive intervention during adolescence is crucial for maintaining periodontal health and preventing disease progression into chronic and destructive forms. The use of Sebidin as an adjunct to routine oral hygiene significantly enhances the effectiveness of preventive measures by targeting the microbial etiology of periodontal diseases.

Compared with data from previous studies on antiseptic agents in pediatric dentistry, Sebidin demonstrates comparable or superior outcomes in reducing gingival inflammation and plaque accumulation. Its favorable safety profile, ease of administration, and good patient compliance make it particularly suitable for preventive programs in adolescent populations.

Conclusion

Sebidin is a safe, effective, and convenient antiseptic agent for the prevention of periodontitis in adolescents. Its combined use with standard oral hygiene measures significantly improves periodontal health, reduces gingival inflammation and bleeding, and lowers the risk of disease progression. The findings support the inclusion of Sebidin in preventive dental protocols for adolescents.

References

1. Newman M.G., Takei H., Klokkevold P.R., Carranza F.A. **Carranza's Clinical Periodontology**. 13th ed. Philadelphia: Elsevier; 2020.
2. Lindhe J., Lang N.P., Karring T. **Clinical Periodontology and Implant Dentistry**. 6th ed. Oxford: Wiley-Blackwell; 2019.

3. Slots J. Periodontal microbiology: Pathogens, virulence factors, and host responses. *Periodontology* 2000. 2017;75(1):7–18.
doi:10.1111/prd.12230
4. Pihlstrom B.L., Michalowicz B.S., Johnson N.W. Periodontal diseases. *The Lancet*. 2018;366(9499):1809–1820.
doi:10.1016/S0140-6736(05)67728-8
5. Tonetti M.S., Greenwell H., Kornman K.S. Staging and grading of periodontitis: Framework and proposal. *Journal of Periodontology*. 2018;89(Suppl 1):S159–S172.
doi:10.1002/JPER.18-0006
6. Albandar J.M., Tinoco E.M. Global epidemiology of periodontal diseases in children and adolescents. *Periodontology* 2000. 2019;29(1):153–176.
doi:10.1034/j.1600-0757.2002.290108.x
7. Lang N.P., Bartold P.M. Periodontal health. *Journal of Periodontology*. 2018;89(Suppl 1):S9–S16.
doi:10.1002/JPER.16-0517
8. Sanz M., Beighton D., Curtis M.A. Role of microbial biofilms in the maintenance of oral health. *Journal of Clinical Periodontology*. 2017;44(Suppl 18):S5–S11.
doi:10.1111/jcpe.12691
9. van der Weijden G.A., Slot D.E. Oral hygiene in the prevention of periodontal diseases: Evidence-based recommendations. *Periodontology* 2000. 2017;55(1):104–123.
doi:10.1111/j.1600-0757.2010.00337.x
10. Jones C.G. Chlorhexidine: Is it still the gold standard? *Periodontology* 2000. 2018;15(1):55–62.
doi:10.1111/j.1600-0757.1997.tb00105.x

RENAL FIBROSIS IN CHRONIC KIDNEY DISEASE: RADIOLOGICAL IMAGING MARKERS AND PREDICTIVE VALUE

Resume. Renal fibrosis plays a central role in the development and progression of chronic kidney disease (CKD) and ultimately leads to irreversible loss of renal function. Early detection of fibrotic changes is important for assessing disease prognosis and selecting appropriate management strategies. In this context, radiological imaging methods are increasingly used as non-invasive tools for evaluating structural and functional changes in renal tissue.

This review summarizes the main radiological markers of renal fibrosis identified by ultrasound and computed tomography. These include reduced kidney size, cortical thinning, increased parenchymal echogenicity, altered renal blood flow, and increased tissue stiffness. The association of these imaging findings with CKD stage and clinical parameters is highlighted.

Radiological markers show significant prognostic value and may be useful for early detection of renal fibrosis, risk stratification, and follow-up of patients with CKD. Their use contributes to improved diagnostic accuracy and better prediction of disease progression.

Keywords: renal fibrosis; chronic kidney disease; radiological markers; ultrasound; computed tomography; elastography; imaging; prognosis.

Introduction. Chronic kidney disease (CKD) is a major global health problem associated with high morbidity, mortality, and healthcare costs. The disease is characterized by a progressive decline in renal function, often leading to end-stage renal disease. Regardless of the initial cause, renal fibrosis represents the final common pathological pathway of CKD progression. It is marked by excessive accumulation of extracellular matrix, tubular atrophy, and irreversible structural damage to the renal parenchyma.

Early detection of renal fibrosis is crucial for predicting disease progression and optimizing patient management. Although renal biopsy remains the gold standard for diagnosing fibrosis, its invasive nature, risk of complications, and limited feasibility for repeated assessments restrict its routine use. As a result, non-invasive imaging techniques have gained increasing attention as potential tools for evaluating renal fibrosis and monitoring CKD progression.

This review focuses on radiological markers of renal fibrosis identified by ultrasound and computed tomography (CT) and discusses their clinical and prognostic significance in patients with CKD.

Renal fibrosis develops as a consequence of sustained inflammation, ischemia, and activation of profibrotic signaling pathways. Key cellular mechanisms include activation of fibroblasts and myofibroblasts, epithelial-to-mesenchymal transition, and increased production of collagen and other extracellular matrix components. These processes lead to stiffening of renal tissue, disruption of normal microarchitecture, and progressive loss of nephron function.

As fibrosis advances, structural changes become detectable by imaging modalities, providing an opportunity for non-invasive assessment of disease severity.

Ultrasound is widely used as the first-line imaging modality in CKD due to its accessibility, safety, and low cost. Reduced kidney length and volume are well-recognized indicators of chronic irreversible renal damage. Cortical thinning reflects loss of functional nephrons and correlates with the degree of interstitial fibrosis.

Increased renal parenchymal echogenicity compared to the liver or spleen is a common ultrasound finding in CKD. This change is associated with fibrotic tissue replacement and correlates with histological fibrosis and declining glomerular filtration rate (GFR).

Doppler ultrasound provides functional information on renal perfusion. Elevated resistive index (RI) values reflect increased vascular resistance caused by interstitial fibrosis and vascular remodeling. Several studies have demonstrated a relationship between increased RI and disease severity, as well as adverse renal outcomes.

Elastography is an emerging technique that measures tissue stiffness. Since fibrotic tissue is mechanically stiffer than normal parenchyma, elastography has shown promising results in detecting and quantifying renal fibrosis. Increased renal stiffness has been associated with advanced CKD stages and reduced renal function, suggesting its potential role as a quantitative imaging biomarker.

Computed tomography allows detailed anatomical evaluation of the kidneys and surrounding structures. In CKD patients, CT may reveal reduced renal size, cortical thinning, and parenchymal atrophy, which indirectly reflect fibrotic changes.

Non-contrast CT is commonly used to avoid nephrotoxic contrast agents. Changes in parenchymal density and structural heterogeneity have been investigated as potential markers of chronic damage. Although CT provides less functional information than ultrasound, it remains valuable in complex diagnostic cases and in patients with inconclusive ultrasound findings.

Radiological markers of renal fibrosis have demonstrated significant prognostic value. Imaging findings such as cortical thinning, increased echogenicity, elevated resistive index, and increased tissue stiffness correlate with

faster decline in renal function and higher risk of progression to advanced CKD stages.

Non-invasive imaging allows repeated assessments over time, making it useful for monitoring disease progression and evaluating treatment response. Integration of radiological markers with clinical and laboratory data enhances risk stratification and supports personalized patient management.

The use of radiological imaging in the assessment of renal fibrosis provides clinicians with valuable information beyond traditional laboratory parameters. Ultrasound, particularly when combined with Doppler and elastography, offers a practical and effective approach for routine clinical practice.

Future research should focus on standardization of imaging protocols, validation of quantitative imaging biomarkers, and correlation with histopathological findings. Advances in imaging technology and artificial intelligence may further improve the accuracy and reproducibility of fibrosis assessment.

The increasing prevalence of chronic kidney disease worldwide highlights the urgent need for reliable, non-invasive tools to assess renal damage and predict disease progression. Radiological imaging plays an important role in routine clinical practice, as it allows repeated evaluation of renal structure and function without the risks associated with invasive procedures. The identification of imaging-based markers of renal fibrosis has significant clinical implications for nephrologists, radiologists, and healthcare systems.

In daily practice, ultrasound remains the most accessible and widely used imaging modality for patients with CKD. Conventional ultrasound parameters such as kidney size, cortical thickness, and parenchymal echogenicity provide valuable baseline information and help differentiate acute from chronic renal pathology. When combined with Doppler assessment, ultrasound can also offer insights into renal hemodynamics, allowing indirect evaluation of microvascular damage associated with fibrosis. These findings are particularly useful in patients with advanced CKD, where laboratory markers alone may not fully reflect structural disease severity.

The integration of ultrasound elastography into clinical workflows represents an important step toward quantitative assessment of renal fibrosis. Elastography has the potential to detect subtle changes in tissue stiffness before irreversible structural damage becomes apparent on conventional imaging. This may allow earlier identification of high-risk patients and facilitate timely therapeutic interventions aimed at slowing disease progression. Moreover, elastography can be repeated over time, making it a promising tool for monitoring treatment response and disease dynamics.

From a prognostic perspective, radiological markers can assist in risk stratification of CKD patients. Imaging findings associated with advanced fibrosis have been linked to faster decline in renal function, increased likelihood of progression to end-stage renal disease, and poorer overall outcomes. Incorporating imaging data into clinical decision-making may help clinicians individualize

follow-up intervals, optimize therapeutic strategies, and identify patients who may benefit from closer monitoring or early referral for renal replacement therapy planning.

Computed tomography, although less frequently used due to radiation exposure and contrast-related risks, retains an important role in selected clinical scenarios. Non-contrast CT can provide detailed anatomical information when ultrasound findings are inconclusive or limited by patient-related factors such as obesity or bowel gas. CT-based structural markers of chronic damage may complement ultrasound findings and contribute to a more comprehensive assessment of renal fibrosis in complex cases.

Despite these advantages, several challenges remain. One major limitation is the lack of standardized imaging protocols and universally accepted cutoff values for radiological markers of renal fibrosis. Variability in equipment, operator experience, and measurement techniques can affect reproducibility and limit comparison between studies. Therefore, large-scale, multicenter studies are needed to validate imaging biomarkers and establish standardized reference ranges.

Future perspectives in this field include the integration of advanced imaging techniques, such as multiparametric ultrasound, texture analysis, and machine learning–based image interpretation. Artificial intelligence may help identify subtle imaging patterns associated with early fibrosis and improve diagnostic accuracy while reducing operator dependence. Combining radiological markers with clinical, laboratory, and molecular data may lead to the development of comprehensive predictive models for CKD progression.

Ultimately, the goal is to move toward a more personalized approach to CKD management, where imaging biomarkers of renal fibrosis guide clinical decisions, improve prognostication, and support timely intervention. Continued collaboration between radiologists, nephrologists, and researchers will be essential to translate these advances into routine clinical practice.

Conclusion. Renal fibrosis is a fundamental pathological process underlying the progression of chronic kidney disease and represents a key determinant of long-term renal outcomes. While renal biopsy remains the reference standard for fibrosis assessment, its limitations necessitate the use of non-invasive alternatives in routine clinical care.

Radiological imaging, particularly ultrasound with Doppler and elastography, provides valuable structural and functional information that reflects the extent of fibrotic changes in the renal parenchyma. Computed tomography serves as a complementary tool in selected cases, offering detailed anatomical assessment when ultrasound is insufficient. Radiological markers demonstrate significant prognostic value and contribute to early detection, risk stratification, and longitudinal monitoring of patients with CKD.

Advances in imaging technologies and data analysis hold promise for improving the accuracy and clinical utility of non-invasive fibrosis assessment. The integration of radiological markers into multidisciplinary CKD management may enhance diagnostic precision, support personalized treatment strategies, and

ultimately improve patient outcomes. Further research and standardization efforts are required to fully establish imaging-based biomarkers as routine tools in the evaluation of renal fibrosis.

REFERENCES:

1. Zhang DL, Chen S, Xu JM, et al. The value of tissue quantitative diffusion analysis of ultrasound elastography in the diagnosis of early-stage chronic kidney disease. BMC Nephrology. 2024; 25:328. doi:10.1186/s12882-024-03762-0 — обсуждает применение ультразвуковой эластографии для диагностики фиброза при ХБП.
2. Xian Ling Mo, Meng HY, Wu YY, et al. Shear Wave Elastography in the Evaluation of Renal Parenchymal Stiffness in CKD Patients: Meta-Analysis. J Clin Med Res. 2022; vol: doi:10.14740/jocmr4621 — мета-анализ SWE при оценке жесткости паренхимы в CKD.
3. Kidney tissue elastography and interstitial fibrosis observed in kidney biopsy. PubMed. 2022 — исследование корреляции эластографических измерений с интерстициальным фиброзом при CKD.
4. Ultrasound elastography in chronic kidney disease: a systematic review and meta-analysis. PubMed. 2023 — обзор применения ультразвуковой эластографии у пациентов с ХБП, включая связь жесткости ткани и степени фиброза.
5. Noninvasive assessment of renal fibrosis by magnetic resonance imaging and ultrasound techniques. Translational Research. 2019; 209:105–120 — обзор методов неинвазивной визуализации фиброза, включая УЗИ и МРТ.
6. Elastography as an indicator of renal fibrosis: Journal of the American Society of Nephrology. 2025 — демонстрирует корреляцию между значениями эластографии и степенью фиброза, подтвержденную биопсией.
7. Assessment of Renal Fibrosis Using 2-D Shear Wave Elastography and Clinical Features: A Random Forest Approach. PubMed. 2023 — в этой работе комбинируют эластографию и клинические параметры для оценки степени фиброза.
8. Radiology of fibrosis part III: genitourinary system. Journal of Translational Medicine. 2024 — современное обсуждение имидж-маркерів для оценки фиброза мочевыделительной системы.

IMAGING PREDICTORS OF RENAL FIBROSIS IN CHRONIC KIDNEY DISEASE: ULTRASOUND AND MULTISLICE COMPUTED TOMOGRAPHY ASSESSMENT

Resume. Renal fibrosis is a central pathological process driving the progression of chronic kidney disease (CKD) and leading to irreversible loss of renal function. Timely detection of fibrotic changes remains challenging due to the invasive nature of histological assessment. Therefore, non-invasive imaging techniques play a crucial role in the evaluation of renal fibrosis.

This study aims to assess the value of ultrasound (US) and multislice computed tomography (MSCT) as imaging predictors of renal fibrosis in patients with chronic kidney disease. Renal imaging was performed using standardized ultrasound and MSCT protocols. Key imaging parameters, including renal size, cortical thickness, parenchymal echogenicity, corticomedullary differentiation, and parenchymal density, were analyzed. Imaging findings were evaluated in relation to clinical and laboratory indicators of renal dysfunction.

The results demonstrate that increased cortical echogenicity, reduced renal length, loss of corticomedullary differentiation on ultrasound, as well as decreased parenchymal density and cortical thinning on MSCT, are significantly associated with the presence and severity of renal fibrosis. The combined application of ultrasound and MSCT improved the accuracy of non-invasive assessment.

In conclusion, ultrasound and multislice computed tomography provide reliable imaging predictors of renal fibrosis in chronic kidney disease. Their integrated use may enhance early diagnosis, risk stratification, and clinical decision-making in CKD patients.

Keywords: Renal fibrosis; Chronic kidney disease; Ultrasound; Multislice computed tomography; Imaging predictors; Non-invasive assessment.

Introduction. Chronic kidney disease (CKD) represents a major global public health problem, characterized by a progressive and irreversible decline in renal function. Regardless of the initial etiology, renal fibrosis is widely recognized as the final common pathological pathway leading to end-stage renal disease. Renal fibrosis is defined by excessive accumulation of extracellular matrix components, including collagen and fibronectin, resulting in structural distortion of renal parenchyma and loss of functional nephrons.

At the cellular level, renal fibrosis is driven by persistent inflammation, activation of fibroblasts and myofibroblasts, tubular epithelial cell injury, and microvascular rarefaction. These processes ultimately lead to tubular atrophy, interstitial expansion, and glomerulosclerosis. Importantly, the degree of renal fibrosis has been shown to correlate strongly with disease severity, progression rate, and clinical outcomes in patients with CKD.

Renal biopsy remains the gold standard for the assessment of renal fibrosis. However, its invasive nature, potential complications, sampling variability, and limited feasibility for repeated evaluation restrict its routine use. Consequently, there is a growing clinical demand for reliable, non-invasive diagnostic methods capable of detecting and quantifying fibrotic changes in the kidneys.

Imaging techniques play a crucial role in the evaluation of renal structure and function in CKD. Advances in radiological modalities have significantly expanded the ability to assess morphological and structural changes associated with renal fibrosis. Non-invasive imaging methods offer several advantages, including safety, repeatability, and accessibility, making them particularly valuable for longitudinal monitoring of CKD patients.

Among available imaging techniques, ultrasound (US) and multislice computed tomography (MSCT) remain the most widely used modalities in routine clinical practice. These methods provide essential information regarding renal size, parenchymal architecture, cortical thickness, and tissue density, which may serve as indirect imaging predictors of fibrotic remodeling.

Recent studies have increasingly focused on identifying specific imaging biomarkers that correlate with histological fibrosis and renal functional decline. The concept of “imaging predictors” has gained attention as a promising approach to risk stratification and prognosis assessment in CKD.

Ultrasound is the first-line imaging modality for the evaluation of patients with suspected or established CKD. Its widespread availability, low cost, and absence of ionizing radiation make it an ideal tool for initial assessment and follow-up.

Several ultrasound features have been associated with renal fibrosis. Increased renal cortical echogenicity is one of the most frequently reported indicators and reflects structural alterations within the renal parenchyma. Enhanced echogenicity is believed to result from fibrotic tissue deposition, tubular atrophy, and inflammatory infiltration.

Reduction in renal length and volume represents another important ultrasound marker. Progressive renal shrinkage is commonly observed in advanced stages of CKD and correlates with irreversible parenchymal loss. Cortical thinning has also been identified as a significant predictor of chronic parenchymal damage and fibrotic transformation.

Loss of corticomedullary differentiation is considered a hallmark of chronic renal injury. This finding reflects the disruption of normal renal architecture and has been linked to advanced interstitial fibrosis and glomerulosclerosis.

Although conventional ultrasound is limited by operator dependency and qualitative assessment, it remains a valuable non-invasive tool for identifying structural predictors of renal fibrosis, especially when combined with clinical and laboratory data.

Multislice computed tomography provides high-resolution cross-sectional imaging and allows detailed evaluation of renal anatomy. MSCT enables precise assessment of renal size, cortical thickness, and parenchymal density, which are important parameters in the context of fibrotic changes.

Decreased renal parenchymal attenuation values on non-contrast CT have been associated with chronic parenchymal damage and fibrosis. This reduction in tissue density may reflect fatty infiltration, interstitial expansion, and loss of functional tissue.

Cortical thinning observed on MSCT has demonstrated strong correlation with renal functional impairment and histopathological fibrosis. Furthermore, MSCT allows accurate volumetric analysis, which may enhance the assessment of global renal damage compared to linear measurements alone.

Despite concerns regarding radiation exposure and the use of contrast agents, non-contrast MSCT protocols have been increasingly utilized to evaluate chronic renal pathology. In selected cases, MSCT provides complementary information to ultrasound, particularly in patients with limited acoustic windows or complex anatomical conditions.

The integration of ultrasound and multislice CT findings may improve diagnostic accuracy in the non-invasive assessment of renal fibrosis. While ultrasound offers real-time evaluation and functional insight, MSCT provides superior anatomical detail and quantitative measurements.

Studies suggest that combining ultrasound-derived parameters such as cortical echogenicity and renal length with MSCT-based measurements of cortical thickness and parenchymal density enhances the prediction of fibrotic severity. This multimodal imaging approach supports more comprehensive evaluation of renal structural remodeling.

The use of combined imaging predictors may also facilitate early identification of patients at higher risk of CKD progression, enabling timely therapeutic interventions and improved patient management.

The identification of reliable imaging predictors of renal fibrosis has significant clinical implications. Non-invasive diagnostics can reduce the need for renal biopsy, allow repeated assessments, and support individualized treatment strategies.

Ongoing research is focused on refining imaging criteria, standardizing measurement protocols, and integrating imaging findings with emerging biomarkers and artificial intelligence-based analysis. These advances may further enhance the role of imaging in the personalized management of CKD.

In conclusion, ultrasound and multislice computed tomography represent essential non-invasive tools for the evaluation of renal fibrosis in chronic kidney

disease. Their combined application offers promising potential for early diagnosis, prognostic assessment, and optimization of clinical decision-making.

The growing emphasis on non-invasive diagnostics has led to increased interest in imaging-based biomarkers capable of reflecting renal fibrosis without the need for histological confirmation. Imaging biomarkers are defined as objectively measurable imaging features that indicate normal or pathological biological processes. In the context of CKD, such biomarkers are particularly valuable due to the chronic and progressive nature of the disease.

Ultrasound and MSCT-derived parameters serve as indirect indicators of fibrotic remodeling. Although they do not visualize fibrosis at the microscopic level, these imaging features reflect macroscopic structural changes resulting from prolonged fibrogenesis. The ability to repeatedly assess these parameters over time provides an opportunity for dynamic monitoring of disease progression.

Recent research highlights the importance of quantitative imaging approaches. For example, standardized measurements of cortical thickness, renal volume, and parenchymal density may improve reproducibility and reduce operator dependency. Quantitative imaging enhances objectivity and supports the development of predictive models for CKD progression.

A critical aspect of imaging predictors is their correlation with renal functional parameters. Numerous studies have demonstrated significant associations between imaging findings and estimated glomerular filtration rate (eGFR), serum creatinine levels, and proteinuria.

Reduced renal length and cortical thinning are consistently associated with decreased eGFR and advanced CKD stages. Increased cortical echogenicity on ultrasound has been shown to correlate with interstitial fibrosis and tubular atrophy, which are key determinants of renal function decline.

MSCT-based measurements, particularly parenchymal attenuation values, have also demonstrated correlations with renal function. Lower attenuation values may indicate chronic parenchymal damage and reduced nephron mass. These findings support the role of imaging predictors as surrogate markers of renal functional reserve.

Importantly, imaging predictors may provide prognostic information beyond traditional laboratory parameters, especially in patients with stable biochemical markers but progressive structural damage.

Despite their clinical utility, conventional ultrasound and MSCT have inherent limitations in the assessment of renal fibrosis. Ultrasound is highly operator-dependent and largely qualitative, which may limit its sensitivity in early stages of fibrotic change. Patient-related factors, such as obesity and bowel gas, can further reduce image quality.

MSCT, while offering superior anatomical resolution, involves exposure to ionizing radiation. The use of contrast agents is often contraindicated in CKD patients due to the risk of contrast-induced nephropathy, limiting functional assessment. Additionally, MSCT primarily detects advanced structural alterations rather than early fibrotic changes.

These limitations underscore the need for careful interpretation of imaging findings and emphasize the importance of multimodal approaches that integrate imaging, clinical, and laboratory data.

The future of renal fibrosis assessment lies in the integration of imaging with emerging diagnostic technologies. Advanced ultrasound techniques, such as elastography, and CT-based texture analysis are being actively investigated as potential tools for improved fibrosis detection.

Furthermore, artificial intelligence and machine learning algorithms have shown promise in analyzing complex imaging datasets. Automated image analysis may enable identification of subtle patterns associated with early fibrotic changes that are not readily apparent to the human eye.

Combining imaging predictors with circulating biomarkers, genetic factors, and clinical risk scores may lead to comprehensive diagnostic models capable of personalized risk stratification in CKD patients.

From a clinical perspective, reliable imaging predictors of renal fibrosis can significantly influence patient management. Early identification of patients at high risk of progression allows timely initiation of renoprotective therapies and closer follow-up.

For Scopus-indexed research, the topic of imaging-based non-invasive diagnostics aligns with current trends emphasizing precision medicine, reduction of invasive procedures, and cost-effective healthcare solutions. Articles focusing on standardized imaging predictors and their clinical validation are of high relevance and citation potential.

Conclusion. In summary, ultrasound and multislice computed tomography remain cornerstone imaging modalities in the non-invasive assessment of renal fibrosis in chronic kidney disease. Imaging predictors derived from these techniques provide valuable insights into renal structural remodeling, correlate with functional impairment, and support prognostic evaluation.

Continued research aimed at refining imaging biomarkers, improving quantitative analysis, and integrating advanced technologies will further enhance the role of imaging in CKD management.

REFERENCES:

1. Humphreys BD. Mechanisms of renal fibrosis. *Annu Rev Physiol.* 2018; 80:309–326.
2. Liu Y. Cellular and molecular mechanisms of renal fibrosis. *Nat Rev Nephrol.* 2011;7(12):684–696.
3. Boor P, Floege J. Renal fibrosis in 2015: novel insights into mechanisms and therapeutic targets. *Nat Rev Nephrol.* 2015;11(2):65–66.
4. Eddy AA. Overview of the cellular and molecular basis of kidney fibrosis. *Kidney Int Suppl.* 2014;4(1):2–8.
5. Levey AS, Coresh J. Chronic kidney disease. *Lancet.* 2012;379(9811):165–180.
6. Risdon RA, Sloper JC, de Wardener HE. Relationship between renal function and histological changes found in renal biopsy specimens from patients with persistent glomerulonephritis. *Lancet.* 1968;2(7564):363–366.
7. Hricak H, Cruz C, Romanski R, et al. Renal parenchymal disease: sonographic-

histologic correlation. Radiology. 1982;144(1):141–147.

8. Moghazi S, Jones E, Schroeppe J, et al. Correlation of renal histopathology with sonographic findings. Kidney Int. 2005;67(4):1515–1520.

9. Platt JF, Rubin JM, Ellis JH. Distinction between obstructive and nonobstructive pyelocaliectasis with duplex Doppler sonography. AJR Am J Roentgenol. 1989;153(5):997–1000.

10. Emamian SA, Nielsen MB, Pedersen JF, Ytte L. Kidney dimensions at sonography: correlation with age, sex, and habitus in 665 adult volunteers. AJR Am J Roentgenol. 1993;160(1):83–86.

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BOSHLANG'ICH TA'LIMDA XALQARO BAHOLASH TALABLARIGA MOS O'QUV TOPSHIRIQLARINI ISHLAB CHIQISH

Annotatsiya: Ushbu maqola boshlang'ich ta'limda o'quv topshiriqlarini xalqaro baholash standartlariga mos ravishda ishlab chiqish metodikasini takomillashtirish masalalarini ko'rib chiqiladi. Tadqiqotda o'quv topshiriqlarini yaratishda zamonaviy pedagogik yondashuvlar, baholash mezonlari va ta'lim sifatini oshirish usullari tahlil qilinadi.

Kalit so'zlar: Boshlang'ich ta'lim, xalqaro baholash, o'quv topshiriqlari, metodika, ta'lim sifatini oshirish, baholash standartlari

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DEVELOPING TEACHING ASSIGNMENTS IN ACCORDANCE WITH INTERNATIONAL ASSESSMENT REQUIREMENTS IN PRIMARY EDUCATION

Abstract: This article examines the improvement of the methodology for designing learning tasks in primary education according to international assessment standards. The study analyzes modern pedagogical approaches, evaluation criteria, and methods for enhancing the quality of education when creating learning tasks.

Keywords: Primary education, international assessment, learning tasks, methodology, quality of education, assessment standards

Kirish. O'zbekiston Respublikasi Vazirlar Mahkamasining 2018-yil 8-dekabrda "Xalq ta'limi tizimida ta'lim sifatini baholash sohasidagi xalqaro tadqiqotlarni tashkil etish chora-tadbirlari to'g'risida"gi 997-sonli qarori milliy ta'lim tizimini xalqaro baholash dasturlari talablariga moslashtirishda muhim huquqiy asos bo'lib xizmat qiladi.³⁴ Ushbu qarorda PISA, TIMSS, PIRLS kabi xalqaro baholash tadqiqotlariga tayyorgarlik ko'rish, o'quvchilarning o'qish,

³⁴ O'zbekiston Respublikasi Vazirlar Mahkamasining qarori, 08.12.2018 yildagi 997-son

matematik va tabiiy fanlar bo'yicha savodxonligini baholash mexanizmlarini joriy etish hamda xalqaro metodikalarga mos o'quv topshiriqlarini ishlab chiqish tartibini belgilash asosiy vazifalar sifatida belgilangan.

Mazkur hujjat ijrosi doirasida boshlang'ich ta'limda jahon madaniyati, ilmfan yutuqlari va zamonaviy axborot resurslarini kichik yoshdagi maktab o'quvchilariga yetkazish, shuningdek, ta'lim jarayonini o'qituvchi, o'quvchi va otana hamkorligida tashkil etish ta'lim tizimini modernizatsiya qilishning ustuvor yo'nalishlaridan biri sifatida qaralmoqda. Bu orqali yangi O'zbekiston taraqqiyoti uchun raqobatbardosh va malakali kadrlarni tayyorlash, uzluksiz ta'lim tizimining muhim bo'g'ini hisoblangan boshlang'ich ta'limda sifatli bilim olish uchun zarur shart-sharoitlar yaratish imkoniyati kengaymoqda.

Shu jarayonda o'qitish metodlari, usullari va vositalarini to'g'ri tanlash hamda ularni ta'lim jarayoniga samarali tatbiq etish o'quvchilarning ongli o'qish, mustaqil fikrlash va egallangan bilimlarni hayotiy vaziyatlar bilan bog'lay olish ko'nikmalarini shakllantirishda muhim ahamiyat kasb etadi. Global miqyosdagi raqobat va globallashtirish sharoitida pedagogik innovatsion texnologiyalarni joriy etish orqali o'quvchilarning mantiqiy-tahliliy, tanqidiy va ijodiy fikrlash qobiliyatlarini rivojlantirish ta'lim sifatini xalqaro standartlar darajasiga ko'tarishning muhim omillaridan biri hisoblanadi.

Shu bois bugungi kunda boshlang'ich sinf o'qituvchilaridan faqat bilim berish emas, balki o'quvchilarda zamonaviy kompetensiyalar, ko'nikma va malakalarni shakllantirish talab etilmoqda. Mazkur fanning asosiy maqsadi bo'lajak boshlang'ich sinf o'qituvchilarini xalqaro baholash tizimlari (PISA, PIRLS, TIMSS, EGRA, EGMA) bilan tanishtirish, ularning o'tkazilish xususiyatlari va talablari haqida bilim berish hamda boshlang'ich sinf o'quvchilarini ushbu baholash dasturlariga tayyorlash metodikasini o'rgatishdan iboratdir. Bu esa ta'lim jarayonini xalqaro baholash mezonlariga mos holda takomillashtirishga xizmat qiladi.

Xalqaro baholash dasturlari, xususan, PIRLS dasturi 2001-yilda Ta'lim sohasidagi yutuqlarni baholash xalqaro assotsiatsiyasi (IEA) tomonidan joriy etilgan bo'lib, har besh yilda bir marotaba 4-sinf o'quvchilarining o'qish savodxonligini xalqaro darajada baholashga qaratilgan. O'qish savodxonligi o'quvchilarning keyingi ta'lim bosqichlarida muvaffaqiyatli o'qishi va shaxsiy rivojlanishi uchun muhim asos bo'lib xizmat qiladi. Shu sababli PIRLS talablari boshlang'ich ta'limda o'quv topshiriqlarini ishlab chiqishda asosiy yo'nalish sifatida qaralmoqda.

So'nggi yillarda mamlakatimizda amalga oshirilayotgan keng ko'lamli islohotlar iqtisodiyotning jadal rivojlanishiga zamin yaratib, barcha sohalarda raqobatbardosh va malakali kadrlarni tayyorlashga bo'lgan ehtiyojni kuchaytirdi. Bu esa o'quvchilarning darslarga qiziqishini oshirish, o'qituvchilarning ta'limtarbiya jarayoniga yangicha yondashuvlarni joriy etishini talab etadi. Xalqaro baholash dasturlariga mos o'quv topshiriqlari o'quvchilarning faolligi, mustaqil fikrlashi va bilimlarni amaliyotda qo'llash ko'nikmalarini rivojlantirishga xizmat qiladi.

PISA va PIRLS kabi xalqaro baholash dasturlarining asl mohiyati o'quvchilarda tafakkur faolligini shakllantirish, ularni ijodkorlik va innovatsion fikrlashga yo'naltirishdan iboratdir. Shu nuqtayi nazardan, O'zbekistonda xalqaro tajribaga tayangan holda o'quvchilarning bilim darajasini baholash va monitoring qilishga qaratilgan milliy baholash tizimini yanada takomillashtirish dolzarb vazifa hisoblanadi. Ushbu tizim zamon bilan hamnafas rivojlanib, baholash mezonlarini xalqaro talablar asosida doimiy ravishda yangilab borishi orqali boshlang'ich ta'limda o'quv topshiriqlarini ishlab chiqish metodikasini takomillashtirishga xizmat qiladi.

PIRLS (Progress in International Reading Literacy Study) xalqaro baholash tadqiqoti boshlang'ich sinf o'quvchilarining o'qish savodxonligi, matnni anglash va mazmunini tahlil qilish ko'nikmalarini baholashga qaratilgan. Tadqiqot doirasida o'quvchilarning badiiy va axborot matnlarini tushunishi, asosiy g'oyani aniqlashi, xulosalar chiqarishi hamda tanqidiy fikrlash qobiliyatlari muhim mezon sifatida qaraladi. Shu sababli PIRLS talablari asosida o'quv topshiriqlarini yaratishda interfaol metodlardan foydalanish, differensial yondashuvni qo'llash hamda o'quvchilarning funksional savodxonligini rivojlantiruvchi topshiriqlarni ishlab chiqish zarur hisoblanadi.

Boshlang'ich ta'limda xalqaro baholash talablariga mos o'quv topshiriqlarini ishlab chiqish jarayonida o'qituvchilarning metodik tayyorgarligi muhim omil hisoblanadi. PIRLS va TIMSS tadqiqotlariga tayyorlash jarayonida o'qituvchilardan matnlar bilan ishlash, o'quvchilarga matnni tahlil qilishni o'rgatish, muammoli vaziyatlarga asoslangan topshiriqlar tuzish hamda baholash mezonlarini to'g'ri qo'llash malakasi talab etiladi. O'qituvchilarning metodik kompetensiyasi qanchalik yuqori bo'lsa, o'quvchilarning xalqaro baholash sinovlaridagi natijalari ham shunchalik samarali bo'ladi.

Xulosa. Tahlillar shuni ko'rsatadiki, ilg'or mamlakatlar va O'zbekiston maktablari o'quvchilarga bilim berishda yondashuvlarida asosiy farqlarga ega. Xorijiy tajribada bolalar ta'lim jarayonida ortiqcha umumiy fanlar bilan zo'riqtirilmaydi, asosiy fanlar tizimli ravishda o'rganiladi va ularning atrofida o'quv jarayoni tashkil etiladi. Ota-onalar va ta'lim muassasalari o'quvchilarning faqat test savollariga javob berish yoki ma'lumotlarni yodlash bilan cheklanmasdan, ularning zamonaviy jamiyat va mehnat bozoridagi ehtiyojlarga javob bera oladigan bilim va ko'nikmalarini rivojlantirishga intiladi. Shu bois, samarali muloqot, jamoada ishlash, tanqidiy va ijodiy fikrlash, shuningdek, chet tillarda yetarli darajada muloqot qilish qobiliyatlari eng qadrlanadigan ko'nikmalardan hisoblanadi.

Foydalanilgan adabiyotlar

1. O'zbekiston Respublikasi Vazirlar Mahkamasining qarori, 08.12.2018 yildagi 997-son Khodjayev, B.H. (2017). *General Pedagogy*. Tashkent: Sano-Standard Publishing House.
2. O'zbekiston Respublikasi Xalq Ta'limi Vazirligi rasmiy sayti. uzeu.uz
3. Usmonova, D. (2022). Importance of Transposition of Word Categories in English. *O'zbekistonda Fanlararo Innovatsiyalar va Ilmiy Tadqiqotlar Jurnali*, 1(10), 128–131.

- 4.Saidova, G. E. (2024). BOSHLANG 'ICH SINIF TARBIYA DARSLARIDA HADISLAR USTIDA ISHLASHNING UMUMIY METODIKASI. *Экономика и социум*, (12-1 (127)), 362-365.
5. Saidova, Gavhar. "Boshlang 'ich sinf tarbiya darslarida integrativ yondashuv." *MAKTABGACHA VA MAKTAB TA'LIMI JURNALI* 3.3 (2025).

REFLECTION OF SPIRITUAL PROBLEMS OF RUSSIAN SOCIETY IN RUSSIAN PROSE

Abstract. *The article explores the reflection of spiritual problems in Russian prose, focusing on the moral, philosophical, and existential concerns that have shaped Russian literary tradition from the nineteenth century to the present day. Russian prose has consistently functioned as a medium for examining crises of faith, morality, identity, and social responsibility. Through an analysis of key literary tendencies and representative authors, the study demonstrates how spiritual issues are articulated in response to historical, social, and cultural transformations. The research highlights the continuity of spiritual inquiry in Russian literature and its relevance to contemporary societal challenges.*

Keywords: *Russian prose, spiritual crisis, morality, philosophy, social responsibility, literary tradition*

Introduction. Russian literature occupies a unique position in world culture due to its sustained engagement with spiritual and moral questions. Unlike literary traditions that prioritize aesthetic experimentation or entertainment, Russian prose has historically been oriented toward ethical reflection and philosophical depth. Writers have often perceived literature as a moral mission, aimed at understanding the inner life of the individual and the spiritual condition of society as a whole.

The concept of “spiritual problems” in Russian prose encompasses a wide range of issues, including the search for meaning, moral choice, faith and doubt, the nature of good and evil, and the responsibility of the individual before society and history. These concerns have remained central despite changes in political systems and cultural paradigms, making spiritual reflection a defining feature of Russian literary consciousness.

The spiritual orientation of Russian prose was firmly established in the nineteenth century, often regarded as the golden age of Russian literature. Writers such as Fyodor Dostoevsky and Leo Tolstoy developed literary models in which philosophical and moral inquiry became inseparable from narrative structure.

Dostoevsky’s prose focuses on the inner conflict of the individual, exposing the psychological and spiritual consequences of moral transgression, alienation, and ideological extremism. His characters are frequently placed in situations of existential choice, where freedom becomes both a gift and a burden. Tolstoy, by contrast, emphasizes moral self-perfection, spiritual awakening, and the pursuit of truth through ethical living. In his works, spiritual renewal is closely connected with personal responsibility and compassion for others.

These authors established a tradition in which literature serves as a space for spiritual dialogue, addressing not only personal salvation but also the moral direction of society.

The twentieth century introduced radical social and political changes that profoundly affected the spiritual landscape of Russian society. Revolutions, wars, repression, and ideological control led to a crisis of values that was reflected in prose of the period. Writers were compelled to reconsider the relationship between the individual and authority, faith and ideology, truth and survival.

In this context, the works of Mikhail Bulgakov represent a distinctive synthesis of spiritual symbolism and social satire. Bulgakov's prose reveals the conflict between spiritual freedom and totalitarian power, exposing the moral degradation produced by fear, conformity, and materialism. Through fantastical and allegorical elements, he critiques the loss of spiritual integrity in a society dominated by ideological dogma.

The spiritual problem in twentieth-century Russian prose is thus closely linked to questions of conscience, moral compromise, and the preservation of inner freedom under oppressive conditions.

The collapse of the Soviet Union marked another turning point in Russian literary discourse. Post-Soviet prose reflects a society experiencing ideological vacuum, moral disorientation, and a renewed search for spiritual meaning. Writers increasingly depict characters who struggle with loss of faith in collective ideals and attempt to redefine personal values in a fragmented social reality.

Contemporary Russian prose often addresses themes of spiritual emptiness, consumerism, and the erosion of moral boundaries. At the same time, it continues the classical tradition of ethical reflection by exploring individual responsibility in a rapidly changing world. Spiritual problems are no longer framed solely in religious terms but are expressed through existential anxiety, identity crises, and ethical dilemmas related to power, technology, and social inequality.

A distinctive feature of Russian prose is its treatment of literature as a moral and philosophical laboratory. Spiritual problems are not presented as abstract concepts but are embodied in characters, conflicts, and narrative choices. This approach allows readers to engage emotionally and intellectually with complex ethical questions.

Historical Period	Author	Representative Works	Key Spiritual Problems	Literary Interpretation / Focus
19th century (Classical period)	Fyodor Dostoevsky	<i>Crime and Punishment</i> , <i>The Brothers Karamazov</i>	Moral choice, guilt, faith and doubt, freedom and responsibility	Exploration of inner spiritual conflict, the struggle between good and evil, and the search for moral truth
19th century (Classical period)	Leo Tolstoy	<i>War and Peace</i> , <i>Resurrection</i>	Moral perfection, conscience, spiritual	Emphasis on ethical self-improvement and the harmony between personal morality and social duty

			awakening, social justice	
Early 20th century	Anton Chekhov	<i>The Cherry Orchard</i> , short stories	Spiritual emptiness, loss of ideals, passive existence	Depiction of moral stagnation and quiet spiritual crisis in everyday life
Soviet period (1920s– 1930s)	Mikhail Bulgakov	<i>The Master and Margarita</i>	Faith, spiritual freedom, moral corruption, power	Allegorical critique of ideological oppression and loss of spiritual values

This table demonstrates the continuity and transformation of spiritual themes in Russian prose, showing how writers of different historical periods respond to changing social realities while maintaining a strong ethical and philosophical orientation.

Russian prose thus fulfills a dual function: it reflects the spiritual condition of society while simultaneously shaping moral consciousness. By confronting readers with unresolved dilemmas and conflicting values, literature encourages critical self-reflection and ethical awareness.

Conclusion. The reflection of spiritual problems in Russian prose constitutes one of the most enduring and significant aspects of the national literary tradition. From classical writers of the nineteenth century to contemporary authors, Russian prose has persistently addressed questions of morality, faith, freedom, and responsibility. These spiritual concerns emerge in response to historical upheavals and social transformations, yet they remain rooted in a continuous ethical and philosophical discourse.

As a result, Russian prose can be viewed not only as a mirror of societal change but also as a moral guide that challenges readers to confront the spiritual dimensions of human existence. The enduring relevance of these themes confirms the central role of spiritual reflection in the development of Russian literature and its contribution to world culture.

References:

1. Shokhiniso Shukhratovna Shadieva, & Ozoda Tojievna Khujanova (2024). REFLECTION OF SPIRITUAL PROBLEMS IN RUSSIAN SOCIETY THROUGH THE LENS OF RUSSIAN LITERARY TRADITION. *Academic research in educational sciences*, 5 (11), 205-208.
2. Mutovkina Evgenia V. (2023). SPIRITUAL AND MORAL DIMENSIONS OF THE OLD RUSSIAN LITERATURE OF THE 11-12 CENTURIES (PHILOSOPHICAL AND CULTURAL ESSAY EXPERIENCE). *Вестник славянских культур*, (67), 112-120.
3. Karshieva, B. F. (2023). Methodological model of teaching technical students in english on the basis of integrated bilingual education. In *interdiscipline innovation and scientific research conference* (Vol. 1, No. 9, pp. 58-60).

4. Шадиева, Ш. (2022). ЭТНОКУЛЬТУРНАЯ СЕМАНТИКА ПОНЯТИЙ "БОГАТСТВО" И "БЕДНОСТЬ" В РУССКИХ И УЗБЕКСКИХ ПАРЕМИЯХ. *Инновационные исследования в современном мире: теория и практика*, 1(19), 11–13. извлечено от <https://in-academy.uz/index.php/zdit/article/view/2288>
5. Ибодуллаева, Г. Д. (2016). СОВРЕМЕННЫЕ ТЕХНОЛОГИИ В ОБУЧЕНИИ ИНОСТРАННОМУ ЯЗЫКУ. *Вестник современной науки*, (6-2), 60-62.

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SPECIFIC FEATURES OF THE MECHANISMS REGULATING SYSTEMIC HEMODYNAMICS IN WOMEN OF REPRODUCTIVE AGE

Relevance: *The cardiovascular system of women from the onset of menstruation to menopause functions under conditions of continuous hormonal remodeling caused by stage-related changes in endocrine status. In modern scientific literature, this phenomenon is described by the concept of the “hormonal continuum of women’s health,” with the majority of studies focusing on the effects of exogenous sex hormones on hemodynamic parameters. At the same time, in recent years, interest in the preservation and strengthening of women’s reproductive health has significantly increased [1]. Nevertheless, data on age-related features of systemic hemodynamics and its changes during different phases of the menstrual cycle in apparently healthy women remain limited. The active use of modern invasive methods for assessing reproductive potential is usually accompanied by the need for anesthetic support, which requires special attention to the safety of the procedures performed. One of the key indicators of a favorable course of anesthesia is the maintenance of stable patient hemodynamics [3].*

Keywords: *Women of reproductive age, systemic hemodynamics, estrogen, invasive methods.*

Introduction: Systemic hemodynamics in women of reproductive age is shaped by complex and dynamic mechanisms of neurohumoral regulation. Cyclical changes in hormonal background associated with the phases of the menstrual cycle play a significant role in these processes. Sex hormones exert multilevel effects on vascular tone, myocardial contractile function, and peripheral resistance parameters. Despite the growing interest in women’s health issues, the features of systemic hemodynamic regulation in apparently healthy women remain insufficiently studied. This problem is of particular importance in the context of diagnostic and therapeutic interventions requiring anesthetic management. Therefore, the study of the specific mechanisms regulating systemic hemodynamics in women of reproductive age represents a relevant task of modern medicine.

Aim of the Study: The aim of the present study is to investigate the specific features of the mechanisms regulating systemic hemodynamics in women of reproductive age depending on the age category (21–25, 31–35, and 41–45 years).

Materials and Methods: The study was based on monitoring hemodynamic and autonomic changes in women of reproductive age during the first and second phases of the menstrual cycle, as well as in postmenopause (physiological and

surgical), across different age categories. The study was conducted in 2023–2024 at the Bukhara Perinatal Center, in the Department of Gynecology. A total of three groups of women were formed according to age, with 30 participants in each group: 21–25, 31–35, and 41–45 years. The second cohort included 40 women with physiological postmenopause and 28 women with surgical postmenopause, who were also divided into age subgroups of 46–50 and 51–55 years. To assess hemodynamic parameters, the following investigations were performed: complete blood count analyzed using a MINDRAY hematology analyzer (China), and estrogen levels determined by enzyme-linked immunosorbent assay (ELISA). Blood tests were conducted in the laboratory of the Bukhara Perinatal Center. Additionally, all participants underwent electrocardiography with heart rate variability analysis, peripheral vascular rheovasography, spectral analysis of hemodynamic signals, continuous noninvasive blood pressure monitoring, and respiratory wave recording.

Results: The analysis of systemic hemodynamic regulation in women of reproductive age revealed pronounced age-related and phase-dependent differences. In the 21–25-year age group, during the second phase of the menstrual cycle compared with the first phase, an increase in volumetric regulation parameters (stroke volume and cardiac output) by an average of 10–15% was observed, along with an increase in heart rate of approximately 8–12%. At the same time, the power of respiratory waves in the microvasculature decreased by 10–20%. Up to 60–65% of the increase in total spectral power of pulse amplitude and heart rate during the second phase occurred in the slow-wave range (P1–P2), reflecting humoral–metabolic regulatory mechanisms. Simultaneously, a compensatory increase in the activity of high-frequency cardiac regulators (P4, P3%) by 15–20% was observed, indicating enhanced autonomic influence. In women aged 31–35 years, the second phase of the cycle was characterized by a reduction in the power of respiratory waves in the aorta and peripheral vessels by an average of 15–25%, accompanied by a 20–30% increase in the total spectral power of aortic pulsation. Up to 70% of the increase in spectral activity of cardiac output, the aorta, and heart rhythm was attributed to the slowest frequency range (P1), indicating the maximal expression of humoral–metabolic regulation in this age group. In the baroregulatory range (P3), normalized indices decreased by 20–30%, whereas the contribution of the high-frequency range (P4) increased by 15–25%, reflecting enhanced parasympathetic and respiratory regulation. In the 41–45-year age group, the second phase of the menstrual cycle showed the greatest number of statistically significant shifts, affecting more than 75–80% of the analyzed parameters. A decrease in arterial blood pressure by 5–10%, an increase in heart rate by 10–15%, and an increase in volumetric pulsation in the central and peripheral circulation by 20–30% were observed, along with a simultaneous reduction in respiratory waves of the aorta and microvessels by 25–35%. Overall regulatory spectral activity (S, Power) increased by more than 30%; however, the distribution of power across frequency ranges was less organized. Comparative analysis demonstrated that in women aged 41–45 years, absolute and spectral hemodynamic parameters in both phases of the cycle were on

average 20–40% higher than those in younger age groups, accompanied by a 25–30% reduction in the proportion of slow-wave humoral–metabolic oscillations and an increased contribution of sympatho-parasympathetic regulation. Oscillatory activity of the microvasculature in women aged 41–45 years was characterized by lower variability and less pronounced phase-dependent differences compared with women aged 21–25 years.

Conclusion: The conducted study made it possible to identify pronounced age-related and phase-dependent features of the mechanisms regulating systemic hemodynamics in women of reproductive age. It was established that the menstrual cycle has a significant influence on the nature of hemodynamic responses, with the most pronounced changes recorded during the second (luteal) phase of the cycle.

In women aged 21–25 years, the second phase of the menstrual cycle is characterized by a predominantly balanced adaptive response, manifested by a coordinated increase in volumetric circulation parameters, heart rate, and total spectral power of oscillations. Slow-wave humoral–metabolic mechanisms play a dominant role in hemodynamic regulation in this group, while preserved autonomic nervous system activity indicates a high level of functional reserves of the cardiovascular system. In the 31–35-year age group, the maximal expression of slow-wave regulation reflecting humoral–metabolic adaptive mechanisms were observed. During the second phase of the cycle, women in this age group demonstrated the most orderly redistribution of regulatory influences, with reduced baroreflex activity and compensatory enhancement of parasympathetic and respiratory components. This indicates an optimal level of adaptive capacity and the most physiological pattern of systemic hemodynamic regulation during this age period. In women aged 41–45 years, a decrease in the coherence of regulatory mechanisms and a reduction in the contribution of slow-wave humoral oscillations were identified, accompanied by enhanced neural sympatho-parasympathetic regulation. During the second phase of the menstrual cycle, the greatest number of multidirectional and less organized changes in hemodynamic parameters were recorded, which is likely associated with an age-related decline in sex hormone levels and a reduction in their regulatory influence on the cardiovascular system.

Comparative analysis showed that with increasing age, spectral differences between menstrual cycle phases become less pronounced, absolute hemodynamic parameters increase, and the regulatory balance shifts toward high-frequency mechanisms. This reflects a gradual decline in humoral–metabolic control and an increasing role of neural regulatory influences. Thus, the identified features confirm the biological nature of phase-dependent adaptation of systemic hemodynamics in women of reproductive age and emphasize the necessity of considering both age and the phase of the menstrual cycle when assessing the functional state of the cardiovascular system, as well as when planning diagnostic and therapeutic interventions, especially those requiring anesthetic management.

References:

- 1.Astakhov, A. (2005). Regulation of systemic hemodynamics in women at different age periods during the second phase of the menstrual cycle. Hieroglyph, 8(28), 1114–111.
- 2.Peshikov, O. V. (2005). Characteristics of systemic hemodynamics in women with natural postmenopause. In Proceedings of the III Final Scientific-Practical Conference of Young Scientists of Chelyabinsk State Medical Academy (pp. 155–159). Chelyabinsk.
- 3.Cardiovascular function in different phases of the menstrual cycle in healthy women of reproductive age. (2022). Journal of Clinical Medicine, 11(19), 5861. <https://doi.org/10.3390/jcm11195861>
- 4.Shankhwar, V., Urvec, J., Steuber, B., et al. (2024). Effects of menstrual cycle on hemodynamic and autonomic responses to central hypovolemia. Frontiers in Cardiovascular Medicine, 11, 1290703.
- 5.Integrative cardiovascular control in women: Regulation of blood pressure, body temperature, and cerebrovascular responsiveness. (2020). PubMed Review. [Review of the effects of female reproductive hormones on cardiovascular regulation and adaptive mechanisms].
- 6.K., I. A., L., V., H., L., et al. (2024). Doppler ultrasound assessment of blood flow indices in childbearing age women across the menstrual cycle. Medicina (Kaunas), 61(3), 389.

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ZAMONOVIIY O`LCHOV VOSITALARINI SERTIFIKATLASHTIRISHGA DOIR XALQARO STANDART MEYORLARI

Annotatsiya. O`lchov vositalari yoki mahsulotlar jarayonining, to`g`rilovchi amallarni talab qiladigan barcha aniqlangan nomuvofiqliklari tegishli bo`limlar yoki jarayonlar rahbarlari tomonidan tegishli shaklda STPH-03-Sh3 bo`yicha ro`yxatga olinishi talab qilinadi. Nomuvofiqlik sabablarini ularni qaytarilishini oldini olish uchun bartaraf qilishga qaratilgan to`g`rilovchi amallarni aniqlash va bajarish usullarini aniqlash, shuningdek to`g`rilovchi amallarni samarali joriy qilish uchun tegishli vazifalarni ishlab chiqish rol o`ynaydi.

**Kalit so`zlar:** sertifikat, protsedura hujjati, sifat tizimi, ichki audit, menedjment, faoliyati, iste`molchi, shikoyat, jarayon, mutaxassis, nomuvofiqlik.

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INTERNATIONAL STANDARD CRITERIA FOR CERTIFICATION OF MODERN MEASURING INSTRUMENTS

Abstract. All identified non-conformities of measuring instruments or product processes that require corrective actions are required to be recorded by the relevant departments or process managers in the appropriate form according to STPH-03-Sh3. It plays a role in identifying and implementing corrective actions aimed at eliminating the causes of nonconformities to prevent their recurrence, as well as developing appropriate tasks for the effective implementation of corrective actions.

Keywords: certificate, technological document, quality system, internal audit, management, activity, consumer, complaint, process, expert, non-conformity.

Ushbu jarayon sifat menedjmenti tizimi jarayonlarining barcha aniqlangan nomuvofiqlari, mahsulot nomuvofiqliklari, shuningdek iste`molchilar shikoyatlari va e`tirozlariga qo`llaniladi. Ushbu jarayon korxonani barcha jarayonlarida qo`llaniladi. Nomuvofiqlik sabablarini ularni qaytarilishini oldini olish uchun

bartaraf qilishga qaratilgan to'g'rilovchi amallarni aniqlash va bajarish usullarini aniqlash, shuningdek to'g'rilovchi amallarni samarali joriy qilish uchun vazifalarni ishlab chiqish. Korxona tomonidan yetkazib berilgan mahsulotga, uning sifati yoki yetkazib berish shartlariga nisbatan qoniqmaslikni bildiradigan, iste'molchining og'zaki yoki yozma murojati ham qabul qilinadi.

Nomuvofiqliklar quyidagilar natijasida aniqlanishi mumkin:

- sifat tizimini ichki va tashqi auditlarni o'tkazish;
- sifat tizimi jarayonlarini faoliyatini tahlilari va ularni samaradorligini aniqlash;

- sifat tizimining amaldagi va ishlab chiqilayotgan hujjatlarini tahlili;

- mahsulot ishlab chiqarilishini tahlili;

- iste'molchilarni qoniqishini tahlili;

- rahbariyat tomonidan tahlil;

- iste'molchilar shikoyatlarini kelib tushishi.

Mahsulot yoki jarayonning, to'g'rilovchi amallarni talab qiladigan barcha aniqlangan nomuvofiqliklari tegishli bo'limlar yoki jarayonlar rahbarlari tomonidan tegishli shaklda (STPH-03-Sh3) ro'yxatga olinishi kerak. Jarayon rahbari yoki u tomonidan tayinlangan ma'sul shaxs to'g'rilovchi amallarni o'tkazish zaruriyatini belgilashi kerak. Ichki audit natijasida aniqlangan barcha nomuvofiqliklar, STPH-03-2021 protsedurasida ko'zda tutilgan shakldagi (STPH-03-Sh3) nomuvofiqliklar to'g'risidagi bayonnomalarda ro'yxatga olinadi. Bayonnomalarni rasmiylashtirish uchun korxona ichki auditorlari javobgar hisoblanadi. Tashqi auditlar natijasida aniqlangan barcha nomuvofiqlar tashqi auditorlar tomonidan, tashqi auditni o'tkazgan tashkilot tomonidan o'rnatilgan shakllarda ro'yxatga olinadi. Iste'molchilarning barcha yozma shikoyatlari, e'tirozlari raxbar yordamchisi tomonidan kirish hujjatlari jurnalida ro'yxatga olinishi va raxbarga ko'rib chiqish uchun berilishi kerak. Iste'molchining shikoyati og'zaki shaklda kelib tushganda, shikoyatni qabul qilgan shaxs iste'molchi shikoyati to'g'risidagi hisobotni (STPH-03-Sh3) t'yildiradi va uni raxbarga ko'rib chikish uchun beradi. Raxbar tomonidan ko'rib chiqilgan iste'molchilarning shikoyatlari, e'tirozlari javobgar shaxsga o'rganib chiqish va shikoyatlar, e'tirozlarni bartaraf qilish uchun tegishli choralar ko'rish uchun beriladi. Javobgar shaxs tomonidan iste'molchilarning shikoyatlari, e'tirozlari tegishli jarayonlar mutaxassislari bilan tahlil qilinadi va shikoyatni keltirib chiqargan sabablarni va nomuvofiqliklarni bartaraf qilish uchun to'g'rilovchi amallarni aniqlashlari kerak. Javobgar shaxs tomonidan korxona rahbariga shikoyatlar, e'tirozlarni bartaraf qilish bo'yicha ko'rilgan chora-tadbirlar to'g'risida axborot beriladi. Rahbariyat tomonidan tahlillar natijasida aniqlangan nomuvofiqliklar yig'ilish bayonnomasida qayd qilinadi va bayonnoma asosida to'g'rilovchi amallarni o'tkazish bo'yicha tadbirlar ishlab chiqiladi.

Foydalanilgan adabiyotlar.

1. Ismatullaev P.R., Abdullaev A.X., Qodirova SH.A., A'zamov A.A., Miralieva A.Q. Metrologiya, standartlashtirish va sertifikatsiyalash. Ma'ruzalar matni. TDTU 1999 y.

2. Abdullaev A.X. Qodirova SH.A. Metrologiya, standartizatsiya i sertifikatsiya. Uchebnoe posobie. TGTU 2003g.
3. Мухаммадиев Б. С. МЕТРОЛОГИЧЕСКОЕ ОБЕСПЕЧЕНИЕ ПРОИЗВОДСТВА В МАШИНОСТРОИТЕЛЬНОЙ ОТРАСЛИ //Экономика и социум. – 2025. – №. 11-2 (138). С. 872-875.
4. Мухаммадиев Б. С., Шукуров С. У. ПРИМЕНЕНИЕ ИНТЕЛЛЕКТУАЛЬНЫХ ДАТЧИКОВ В ПРОИЗВОДСТВЕ //Экономика и социум. – 2025. – №. 9-1 (136). – С. 680-684.

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RAQAMLI AMPERMETRLARNING METROLOGIK XUSUSIYATLARI

Annotatsiya. Ushbu maqolada raqamli ampermetrlarning ishlash prinsipi va asosiy metrologik xususiyatlari tahlil qilingan. Tokni shunt qarshilik orqali o'lchash usuli asosida ishlovchi raqamli ampermetrlarning aniqligi, rezolyutsiyasi, kvantlash xatoligi va barqarorligi tavsiflangan. Shuningdek, raqamli ampermetrlarni tekshirish va kalibrlash bo'yicha ilmiy tavsiyalar keltirilgan.

Kalit so'zlar: raqamli ampermetr, metrologiya, aniqlik, rezolyutsiya, o'lchash xatoligi, kalibrlash, integratsiya, shunt qarshilik, elektron sxema, tok kuchi.

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METROLOGICAL CHARACTERISTICS OF DIGITAL AMMETERS

Abstract. This article analyzes the operating principle and main metrological characteristics of modern digital ammeters. The accuracy, resolution, quantization error, and stability of digital ammeters based on current measurement using a shunt resistor are discussed. In addition, scientific recommendations for testing and calibration of digital ammeters are presented.

Keywords: digital ammeter, metrology, accuracy, resolution, measurement error, calibration, integration, shunt resistance, electronic circuit, current.

Metrologiya o'lchashlar birligini ta'minlash va o'lchash natijalarining ishonchliligini kafolatlash bilan shug'ullanuvchi muhim ilmiy soha bo'lib hisoblanadi. Elektr kattaliklarini o'lchash, xususan tok kuchini aniqlash sanoat, energetika, avtomatika va elektronika sohalarida muhim o'rin egallaydi.

Yaqin yillargacha tokni o'lchashda elektromexanik ampermetrlardan foydalanilgan. Biroq zamonaviy texnologiyalarning rivojlanishi natijasida raqamli ampermetrlar keng joriy etildi. Ular yuqori aniqlik, o'lchash natijalarini qulay ko'rinishda aks ettirish hamda avtomatlashtirilgan tizimlar bilan integratsiyalash

imkoniyatiga ega. Shu sababli raqamli ampermetrlarning metrologik xususiyatlarini chuqur o'rganish dolzarb masaladan biri bo'lib hisoblanadi.

Raqamli ampermetrning umumiy tavsifi:

Raqamli ampermetrlar elektr tokini o'lchash uchun mo'ljallangan elektron o'lchov asboblari bo'lib, o'lchangan qiymat raqamli displeyda ko'rsatiladi. Ushbu asboblarda analog signalni qabul qilib, uni raqamli shaklga o'tkazadi. Natijada o'lchash jarayonida inson omili kamayadi va xatoliklar sezilarli darajada pasayadi.

Amaliyotda keng qo'llaniladigan raqamli ampermetrlar asosan shunt qarshilik asosida ishlaydi. Tok shunt orqali o'tganda, unda ma'lum kuchlanish hosil bo'ladi. Ushbu kuchlanish qiymati tok miqdoriga mutanosib bo'lib, keyinchalik elektron sxema orqali qayta ishlanadi. Natijada tok qiymati aniq va barqaror tarzda aniqlanadi.



1-rasm. Raqamli ampermetrning ko'rinishi.

Raqamli ampermetrning ishlash rejimi:

Raqamli ampermetrning ishlash rejimi tokni kuchlanishga aylantirish va ushbu kuchlanishni raqamlashtirishga asoslangan. Tok shunt qarshilik orqali o'tganda, shuntida hosil bo'lgan kuchlanish quyidagi keltirilgan formula orqali hisoblanadi:

$$U = I_{sh} \cdot R_{sh}$$

analog-raqamli o'zgartirgichga uzatiladi.

Bu yerda:

- I_{sh} – shunt orqali o'tgan tok (A)
- R_{sh} – shunt qarshilik (Ω)
- U – shunt kuchlanishi (V)

Analog-raqamli o'zgartirgich ushbu signalni quyida ko'rsatilgan formulaga asosan raqamli kodga aylantiradi:

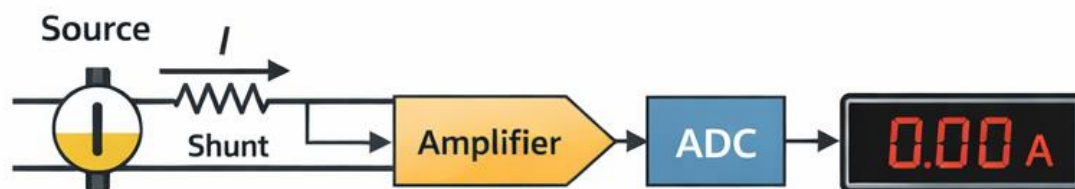
$$D = \frac{U}{U_{ref}} \cdot 2^n$$

Bu yerda:

- D – raqamli qiymat

- U_{ref} – referens kuchlanish
- n – ADC razryad soni

Raqamli ampermetrning ishlash rejimiga asoslangan quyidagi sxema asosida amalga oshiriladi.



2-rasm. Raqamli ampermetrning ishlash rejimiga asoslangan sxema ko`rinishi.

Raqamli ampermetrning ayrim metrologik xususiyatlari:

Raqamli ampermetrlarning metrologik xususiyatlari ularning o'lchash imkoniyatlarini baholashda asosiy mezon hisoblanadi: aniqlik, rezolyutsiya, sezgirlik, takrorlanuvchanlik va barqarorlik.

Rezolyutsiya - bu quyidagicha ifodalanadi:

$$\Delta I_{\min} = \frac{I_{\max}}{2^n}$$

Aniqlik o'lchash natijasining haqiqiy qiymatga qanchalik yaqin ekanligini bildiradi. Takrorlanuvchanlik bir xil sharoitda bir necha marta o'lchash natijalarining o'zaro yaqinligini ko'rsatadi. Barqarorlik esa vaqt o'tishi bilan raqamli ampermetrlarning ko'rsatkichlarining o'zgarmasligini ta'minlaydi.

Raqamli ampermetrning o'lchash xatoligi:

Raqamli ampermetrlarda yuzaga keladigan xatoliklar bir nechta omillar bilan bog'liq: shunt qarshilikning harorat ta'sirida o'zgarishi, elektron komponentlarning eskirishi, tashqi elektromagnit shovqinlar. Shu bilan birga, analog signalni raqamli shaklga aylantirish jarayonida kvantlash xatoligi yuzaga kelishi.

Raqamli ampermetrlarda umumiy xatolik quyidagi formula asosida aniqlanadi:

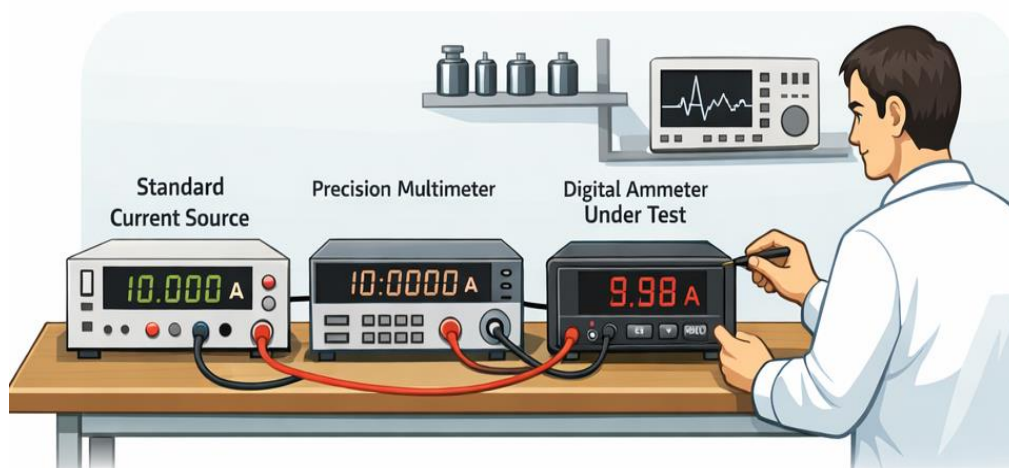
$$\Delta I_{\text{total}} = \sqrt{\Delta I_{sh}^2 + \Delta I_{ADC}^2 + \Delta I_{temp}^2 + \Delta I_{ext}^2}$$

Raqamli ampermetrlarni kalibrlash va tekshirish:

O'lchashlarning aniqligi va barqarorligini ta'minlash uchun raqamli ampermetrlar muntazam kalibrlanishni talab qiladi.

$$I_{\text{measured}} = I_{\text{standard}} + \Delta I_{\text{cal}}$$

Kalibrlashda etalon tok manbalari yordamida amalga oshiriladi va xatoliklar aniqlanadi. Bu jarayon metrologik sifatni oshiradi.



3-rasm. Raqamli ampermetrni kolibrlash jarayoni.

Raqamli ampermetrning amalda qo'llanilishi:

Raqamli ampermetrlar energetika, sanoat avtomatikasi, elektron qurilmalarni sinovdan o'tkazish va ilmiy tadqiqotlarda keng qo'llaniladi. Ular yuqori aniqlik va qulay interfeysga ega bo'lib, o'lchash jarayonini soddalashtiradi. Shuningdek, kompyuter tizimlari bilan bog'lanib, o'lchash natijalarini saqlash va tahlil qilish imkonini beradi.

Metrologik tavsiyalar va aniqlikni oshirish bo'yicha ilmiy yondashuv:

1. Shunt qarshilik barqarorligi va termal kompensatsiya: Shunt materiali haroratga sezgir bo'lmashligi va qarshilik qiymati minimal darajada o'zgarishi lozim. Tok o'tishi natijasida hosil bo'ladigan termal effektni kompensatsiya qilish aniqlikni oshiradi.

2. Raqamli ampermetrni optimallashtirish: Yuqori razryadli analog-raqamli o'zgartirgichlardan foydalanish va konversiya tezligini optimallashtirish kvantlash xatolarini kamaytiradi.

3. Harorat va tashqi muhitni boshqarish: O'lchash jarayonida haroratni monitoring qilish va avtomatik kompensatsiya, ekranlangan kabellar va shovqinga chidamli komponentlardan foydalanish aniqlikni oshiradi.

4. Takrorlanuvchanlikni yaxshilash: Standart metodlar asosida bir xil sharoitda o'lchashlar amalga oshirilsa, natijalar takrorlanuvchan bo'ladi va statistik xatoliklar kamayadi.

5. Kalibrlash va etalonlardan foydalanish: Muntazam kalibrlash va etalon tok manbalaridan foydalanish o'lchash xatolarini ilmiy asosda aniqlashga imkon beradi.

6. Signalni qayta ishlash va filtrlash: Matematik filtrlar yordamida shovqin va kvantlash xatolari kamayadi, ayniqsa past tok diapazonida aniqlik oshadi.

7. Barqarorlikni monitoring qilish: Elektron komponentlarning qarish jarayoni va boshqa vaqtga bog'liq o'zgarishlarni tahlil qilib, asbobni sozlash aniqlikni saqlashga yordam beradi.

Raqamli ampermetrlar elektr tokini o'lchashda yuqori aniqlik va ishonchlilikni ta'minlaydi. Ularning metrologik xususiyatlarini chuqur tahlil qilish va to'g'ri kalibrlash o'lchash sifatini oshiradi. Mazkur maqola raqamli ampermetrlarni tanlash va ulardan samarali foydalanishda muhim ahamiyatga ega.

Foydalanilgan adabiyotlar.

1. O'zbekiston Respublikasi. O'lchashlar birligini ta'minlash to'g'risida qonuni. Toshkent, 2020.
2. G'.M.Shertaylaqov. O'lchashlarning fizikaviy asoslari. Darslik. Jizzax 2023.
3. Waldemar Nawrocki, Introduction to Quantum Metrology; Quantum Standards and Instrumentation 2015th / Springer. London, 2015, 273 page.
4. A. A. Abduraxmanov. Elektr o'lchash usullari va vositalari. Darslik. Jizzax 2023. 180 b.
5. Bentley J.P. Principles of Measurement Systems. Pearson Education, 2005.
6. BIPM. The International System of Units (SI). Paris, 2019.
7. Мухаммадиев Б. С. МЕТРОЛОГИЧЕСКОЕ ОБЕСПЕЧЕНИЕ ПРОИЗВОДСТВА В МАШИНОСТРОИТЕЛЬНОЙ ОТРАСЛИ //Экономика и социум. – 2025. – №. 11-2 (138). – С. 872-875.
8. Saparovich M. B., Akbarovna K. M. O'LCHASH ISHLARIDA INTELLEKTUAL DATCHIKLARDAN FOYDALANISHNING AFZALLIKLARI //THE THEORY OF RECENT SCIENTIFIC RESEARCH IN THE FIELD OF PEDAGOGY. – 2024. – Т. 3. – №. 28. – С. 48-55.
9. Saparovich M. B., Akbarovna K. M. ISHLAB CHIQUARISHDA QO'LLANILADIGAN O'ZGARTKICHLARNING ASOSIY XUSUSIYATLARI VA ISHLASH TAMOIYILLARI //INNOVATION IN THE MODERN EDUCATION SYSTEM. – 2024. – Т. 5. – №. 47. – С. 255-261.
10. Мухаммадиев Б. С., Шукуров С. У. ПРИМЕНЕНИЕ ИНТЕЛЛЕКТУАЛЬНЫХ ДАТЧИКОВ В ПРОИЗВОДСТВЕ //Экономика и социум. – 2025. – №. 9-1 (136). – С. 680-684.
11. Рустамов Н. Т. и др. Коэффициент полезного действия фрактальных солнечных коллекторов //Экономика и социум. – 2025. – №. 2-2 (129). – С. 405-412.

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INLAND WATERS OF NAVAI REGION AND THEIR NATURAL GEOGRAPHICAL SIGNIFICANCE

Abstract: *This article comprehensively covers the inland waters of Navoiy Province, landscape dynamics, soil regimes, vegetation cover, and the impact of anthropogenic changes based on scientific literature. The influence of the Zarafshon River, groundwater layers, desert areas, reservoirs, and irrigation systems on the region's ecological stability has been analyzed.*

Keyword: *inland waters, surface waters, rivers, reservoirs, lakes, artificial irrigation facilities, groundwater.*

Inland waters include rivers, lakes, groundwater, glaciers, reservoirs, canals and ditches. Inland waters depend not only on the climatic characteristics of the country, but also on other elements of its nature, in particular, its relief. According to the definition of the expert geographer P. Baratov, “inland waters are a complex of all water bodies located on land and not directly included in the waters of the oceans and seas” - scientifically substantiated³⁵. They are an important component of the geographical crust and play a significant role in the formation of natural landscapes and the socio-economic development of regions.

Inland waters are important in ensuring the stability of natural ecosystems. It is known that the territorial density of rivers and lakes, their water regime, primarily depends on the climatic conditions and relief of the area. The territory of Uzbekistan has its own hydrological characteristics, which differ in the geographical location and natural conditions of the territory. Rivers and lakes are important centers of geomorphological features. At the same time, inland waters are widely used in the areas of drinking water supply, irrigation, industry, energy and transport.

Navoi region is located in the central part of Uzbekistan in the desert and semi-desert zone, and water resources are a decisive factor in the socio-economic development of this region. One of the most important aspects shaping the nature of the region is inland waters, which are the Zarafshan River, groundwater aquifers

³⁵ P.Baratov O'zbekiston tabiiy geografiyasi . T-1996 O'qituvchi.

and artificial reservoirs. Inland waters play a key role in agriculture, industry, drinking water for the population, the formation of ecological systems and landscapes. The state of water resources is closely related to ecological stability, soil fertility, vegetation cover and landscape structure. When assessing the value of water resources in the region, their hydrological, ecological and economic functions play a special role.

It is advisable to divide the water resources of the region into two main systems: groundwater and surface water sources. The largest water source in the region is the Zarafshan River, which directly participates in several sectors of the region. The agrotechnical regime of using the river as an irrigation source has led to anthropogenic changes in landscapes.

The Zarafshan River has a total length of 870 km, an average gradient of 2.9%, and a current basin area of 40,600 km². Approximately 29% is in Tajikistan (11,700 km², 8.4% of Tajik territory), and 71% is in Uzbekistan (28,900 km², 6.5% of Uzbek territory). The river is fed mainly by glacial melt, so the maximum flow occurs in late spring and early summer, and the minimum flow occurs in winter. The average long-term flow on the Tajikistan-Uzbek border is 158 m³/s, and the annual flow is about 5 km³³⁶.

In Navoi, the groundwater level ranges from 2 to 20 meters, and salinity is high in a number of desert areas. The rise in the water level causes secondary salinization of the soil. In many districts of the region, drinking water is obtained from groundwater. Groundwater, as capillary moisture, is an additional source of moisture for vegetation in agricultural zones.

Reservoirs such as Tudakul, Shurkul, and Koratepa in Navoi region, in addition to their multifunctional importance, have a significant impact on the landscape of the region. Although this area is important for the diversity of water, flora, and fauna, it also increases water scarcity due to the high rate of evaporation. Since the region receives little precipitation, reservoirs alleviate seasonal water shortages. Fishery farms have formed around the reservoirs, and there are recreation areas for the population. Reservoirs contribute to the formation of coastal and meadow landscapes and the emergence of stopover zones for bird migration.

The Kuyimozar reservoir is built on the eponymous depression and receives water from Zarafshan and the Amu Darya via the Amu-Bukhara Canal. Its area is 6 km², the deepest point is 22.8 m, the average depth is 16.8 m, and the water capacity is 350 million m³[3].

Tudakol reservoir: Located in the Kyzyltepa district of Navoi region. It was formed naturally as a result of the Zarafshan flood waters flowing into the Tudakol lowland in 1965-1977. It is located in a natural valley 26 km east of Bukhara, in the eastern part of the Kuyimozar reservoir. The reservoir has a standard water level of 223.50 meters, a full volume of 1200 million m³, a water surface area of 213.19 km², a length of 15 km, a width of 14 km, and a depth of 9.8 m[8]. This reservoir

³⁶ Water quality, potential conflicts and solutions—an upstream– downstream analysis of the transnational Zarafshan River (Tajikistan, Uzbekistan) M. Groll • Chr. Opp • R. Kulmatov • M. Ikramova • I. Normatov Received: 24 June 2013 / Accepted: 28 November 2013 Springer-Verlag Berlin Heidelberg 2013

collects excess water from the Zarafshan River through the Urtachol Canal, and is filled with water from the Amudarya through the Amu-Bukhara Machine Canal. In 1960, the Tudakol Reserve with an area of 30 thousand hectares was established on the basis of the reservoir.

Shurkul Reservoir is a reservoir in Bukhara region. It is filled in the autumn-winter season through a specially dug channel from the Zarafshan River. Built in 1977–80. Total volume 170 million m³, surface area 30.5 km², length 5.5 km, width 3.5 km, depth 30 m, average depth 5.7 m, dam length 560 m, dam height 14.5 m, maximum water transfer capacity 35 m³/s. It supplies water to 35 thousand hectares of farmland in G'ijduvan in Bukhara region, Konimekh in Navoi region and other districts.

Due to the natural geographical conditions of the region, agricultural products: grain, cotton, vegetables, viticulture, horticulture, etc. are cultivated at the expense of inland waters. The efficiency of irrigation systems is considered a key factor in productivity. It also serves to stabilize the landscape system.

The importance of water for industry is high, which justifies the fact that the region is one of the major industrialized centers. The processes of metallurgy, chemistry, and construction materials production in the region are related to water and are organized according to the theory of complexity.

Groundwater is intended for technical purposes and is regulated by state and industry standards, technical conditions or the requirements of specific water-consuming organizations. Groundwater accumulates and moves in the pores, cracks, karst and other cavities of rocks, forming various deposits or separate areas of groundwater accumulation.³⁷

As a result of climate change, improper use of inland waters is accelerating salinization processes and leading to soil degradation. Insufficient collector-drainage systems in irrigation areas are causing groundwater levels to rise and salts to migrate to the soil surface.

Dust and salt aerosols rising from dry saline areas reduce air quality. This process is especially intensified in years of low water. The formation of purposefully created artificial groundwater resources (artificial replenishment of their reserves) is carried out in cases where natural-anthropogenic resources or dynamic reserves are not saturated with water intake at the required level or are of very small volume, which does not provide a limited decrease in the groundwater level for a limited period.

Alluvial processes of the Zarafshan River ensure the relief shape of the valley, the formation of fertile soils and agro-landscapes. Water scarcity increases wind erosion, sand migration and degradation processes. One of the main factors of desertification in Navoi region is the depletion of water resources.

³⁷ Tog‘-kon sanoati va geologiya vazirligining 2025-yil “9” apreldagi 8-sonli Yer osti suvlarining ekspluatatsiya xaxiralari va prognoz resurslari tasnifi"ni ichimlik va texnik suvlar konlariga qo‘llash bo‘yicha qarori 15-ilovasi

Irrigation systems, collector networks, and reservoirs have artificially changed the landscape of the region. Cultural agro-landscapes have emerged in areas that were previously deserts. It is no secret that the irrational use of water resources in the region leads to increased environmental risks. To prevent such negative situations, it is important to conduct scientific assessment, constant monitoring, and analysis of groundwater. These observations, along with GIS, hydrogeological maps, statistical data, are the main scientific tools for monitoring the state of aquifers in desert areas.

In general, the inland water resources of Navoi region are of strategic importance for economic, environmental and social spheres. The Zarafshan River, groundwater aquifers and artificial reservoirs play a key role in agriculture, industry, drinking water supply, ecological balance and landscape formation. Rational management of water resources ensures the sustainable development of the region. At the same time, the fight against desertification and systematic water use practices serve to increase the ecological stability of the region. The impact of inland waters of Navoi region on ecological and landscape systems is a complex and multifactorial process. The depletion of water resources leads to environmental consequences such as soil salinization, desertification, degradation of vegetation cover, deterioration of air quality. Therefore, water management, monitoring and ecological restoration measures are necessary in the region.

Foydalanilgan adabiyotlar ro'yxati:

1. P.Baratov O'zbekiston tabiiy geografiyasi . T-1996 O'qituvchi.
2. Water quality, potential conflicts and solutions—an upstream– downstream analysis of the transnational Zarafshan River (Tajikistan, Uzbekistan) M. Groll • Chr. Opp • R. Kulmatov • M. Ikramova • I. Normatov Received: 24 June 2013 / Accepted: 28 November 2013 Springer-Verlag Berlin Heidelberg 2013.
3. G.I. Hikmatova Quyi Zarafshon vohasi landshaftlari. Monografiya. “Fan ziyosi” nashriyoti. Toshkent – 2025 (38b)
4. Samyayev A.K “Quyi Zarafshon agrolandshaftlarining ekologik holati va ularni xaritalashtirish”. Monografiya. Samarqand – 2024 (78-79b)
5. Tog‘-kon sanoati va geologiya vazirligining 2025-yil “9” apreldagi 8-sonli Yer osti suvlarining ekspluatatsiya xazinalari va prognoz resurslari tasnifi"ni ichimlik va texnik suvlar konlariga qo'llash bo'yicha qarori 15-ilovasi.
6. A.R. Rasulov, F.H. Hikmatov, D.P. Aytboyev., Gidralogiya asoslari Toshkent “Unversitet” 2003.
7. Ziyonet.uz sayti.
8. International journal of agrobiotechnology and veterinary medicine. Volume: 02 Issue: 02|2023. To'dako'l suv omborida kimyoviy rejimning o'zgarishi M. F. G'affarova, Sh. Yaxshiyev, D.Yoshiyeva
9. Xudoyberdiyeva, I. A., & Ahmatova, S. N. (2024). ECONOMIC GEOGRAPHICAL DESCRIPTION OF KHARTICHI DISTRICT. Экономика и социум, (11-2 (126)), 516-520.
10. Худойбердиева, И. А., & Утаева, Р. О. (2024). КЛАССИФИКАЦИЯ СЕЛЬСКОХОЗЯЙСТВЕННЫХ ОТРАСЛЕЙ С ЭКОНОМИКО-

ГЕОГРАФИЧЕСКОЙ ТОЧКИ ЗРЕНИЯ (НА ПРИМЕРЕ ЖИВОТНОВОДСТВА НАВОИЙСКОЙ ОБЛАСТИ). Экономика и социум, (12-1 (127)), 1155-1161.

11. Latipov, N. F., & Komilova, N. K. (2022). INDICATORS OF URBAN ENVIRONMENT ASSESSMENT AND CRITERIA FOR THEIR SELECTION. Экономика и социум, (11-1 (102)), 129-134.

12. Latipov, N. (2022). Shaharlar va ularning ekologik muhit bilan bog'liqligi. Scienceweb academic papers collection.

13. Mukhammedova, N. J., & Koziyeva, M. S. (2024). ECONOMIC-SOCIAL GEOGRAPHICAL DESCRIPTION OF NAVBAHAR DISTRICT. World of Scientific news in science, 2(1), 619-623.

14. Komilova, N., Mukhammedova, N., Ermatova, N., Ibragimova, Z., & Bafoeva, S. (2023). Pandemics and their geographical distribution. EMERGENCY MEDICINE, 19(6), 386-392.

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MAKTABGACHA TA'LIMDA EKOLOGIK TARBIYA MASALALARINING YORITILISHI

Annotatsiya. Ushbu maqolada maktabgacha yoshdagi bolalarda ekologik tarbiyani shakllantirish masalalari ilmiy-nazariy jihatdan yoritilgan. Unda ekologik tarbiyaning zamonaviy ta'lim tizimidagi o'rni, uning dolzarbligi hamda bolalarda ekologik ong, ekologik tafakkur va ekologik madaniyatni rivojlantirish zarurati asoslab berilgan. Shuningdek, maktabgacha yoshdagi bolalarning yosh va psixologik xususiyatlarini hisobga olgan holda ekologik tushunchalarni tanlash mezonlari, tirik organizmlarning yashash muhiti bilan o'zaro bog'liqligi va moslashuvchanligi misollar orqali yoritib berilgan.

Kalit so'zlar: ekologik tarbiya, maktabgacha ta'lim, ekologik ta'lim, ekologik ong, ekologik tafakkur, ekologik madaniyat, tabiat bilan tanishtirish, bioekologiya, autekologiya, yashash muhiti, moslashuvchanlik (adaptatsiya), sog'lom turmush tarzi.

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COVERAGE OF ENVIRONMENTAL EDUCATION ISSUES IN PRESCHOOL EDUCATION

Abstract. *This article examines the issues of forming ecological education in preschool children from a scientific and theoretical perspective. It substantiates the role of ecological education in the modern education system, its relevance, as well as the need to develop ecological consciousness, ecological thinking, and ecological culture in children. Also, the criteria for selecting ecological concepts, taking into account the age and psychological characteristics of preschool children, the interrelationship and adaptability of living organisms with the environment are highlighted with examples.*

Keywords: *ecological education, preschool education, ecological education, ecological consciousness, ecological thinking, ecological culture, introduction to nature, bioecology, autoecology, living environment, adaptation, healthy lifestyle.*

Kirish. Hozirgi kunda ekologik tarbiya - maktabgacha ta'lim pedagogikasining yangi yo'nalishi va dolzarb jihatlaridan biridir. Sayyoramizning ekologik holati va uning yomonlashuvi tendensiyasi hozirda yashayotgan odamlardan mavjud vaziyatni tushunishni va unga ongli munosabatda bo'lishni talab qiladi. Ekologik muammolar barcha materiklar va har bir davlatga xosdir. Ular O'zbekistonda ham mavjud hamda har bir mintaqah (hudud)ga xosd farqlanadi.

Hozir har bir hududda yashovchi aholi bolalar salomatligining tobora yomonlashib borayotganini yaxshi bilishadi. Bunga tuproq, suv va havoning turli xil ifloslanishi sabab bo'lmoqda, natijada odamlar sifatsiz oziq-ovqatlar iste'mol qiladilar, sifatsiz tozalanmagan suv ichadi, chiqindi gazlari ko'p bo'lgan havodan nafas oladi.

Shu boisdan ekologik muammolar va ularni bartaraf etish zarurati ta'limda yangi yo'nalish - ekologik yo'nalishni vujudga keltirdi: insonning tabiat bilan qanday ta'siri va unga qanday munosabatdaligi, tabiatda qanday qonuniyatlar mavjudligi va nima uchun insoniyat ularni e'tiborsiz qoldirishga haqli emasligini hamma tushunib yetmoqda. So'nggi yigirma yillik ekologik ta'lim va tarbiyani shakllanish davri bo'ldi. Bu "ekologik ong", "ekologik tafakkur", "ekologik madaniyat", "ekologik ta'lim", "maktab o'quvchilari, talabalarning ekologik ta'limi" va boshqa ko'plab yangi tushunchalarni, shu jumladan "maktabgacha yoshdagi bolalarning ekologik tarbiyasi" tushunchalarini ishlab chiqishni taqoza etdi. Xuddi shu davrda ekologik ta'limning samarali usullarini izlash, bolalar va yoshlarni o'qitish va tarbiyalash texnologiyalari yaratish masalasi dolzarb hisoblanmoqda.

Asosiy qism. Bolalarni tabiat bilan tanishtirishning ilmiy asoslari. Maktabgacha yoshdagi bolaning tashqi muhitga e'tibori deganda tabiatning turli obyektlari kiradi, shuning uchun uning o'simliklar, hayvonlar, jonli tabiat hodisalari bilan tanishishi zarur - bu atrofdagi dunyoni bilish va ijtimoiy tajribani egallashning tabiiy jarayonidir. Kattalarning ushbu maqsadga muvofiq rahbarligi ostida o'tishi bu jarayon turlicha ilmiy asosga ega bo'lishi mumkinligini anglatadi.

Hozirgi vaqtda tabiatshunoslikda yo'nalishlar o'zgarmoqda: xususan, kishilar dunyoqarashida shu paytgacha hukmronlik qilib kelgan biologik asos o'rnini tabiatga, kishilar yaratgan buyumlarga va insonning faoliyatiga yangicha - ekologik

qarash shakllanmoqda. Ekologik dunyoqarash odamlar hayot faoliyatining barcha sohalarida asosiy bo'lib qolmoqda; u ko'p jihatdan davlat siyosatini, ishlab chiqarish, tibbiyot, madaniyat rivojlanishini belgilay boshladi.

Ekologik dunyoqarash ta'lim-tarbiya mahsuli bo'lib, uning shakllanishi insonning ko'p yillik hayoti va ta'limoti davomida asta-sekinlik bilan amalga oshadi. Bu jarayonning boshlanishi esa maktabgacha ta'limda ya'ni bolalik davriga to'g'ri keladi, bu davrda dunyoni anglash va predmetli-tabiiy muhit bilan amaliy o'zaro ta'sirning dastlabki asoslari qo'yiladi.

Maktabgacha yoshdagi bolalarni ekologik tarbiyalash - bu bolalarni tabiat bilan tanishtirish bo'lib, uning asosida ekologik yondashuv yotadi, bunda pedagogik jarayon ekologiya bo'yidagi g'oyalari va tushunchalariga tayanadi. Maktabgacha tarbiya yoshidagi bolalarga ekologik tarbiya berish metodikasini tuzishda qanday tushunchalar ahamiyatga ega degan savolga javob shundaki aniqlanishi kerak bo'lgan birinchi tushuncha bu "ekologiya" tushunchasi: uning ortida nima turibdi, qanday jarayonlarni tushunish nazarda tutilmoqda.

Rus olimi ekolog N.F.Reymers "ekologiya" tushunchasini ta'riflashda bir-biridan farqli darajada ajratiladigan beshta yo'nalishni ajratib ko'rsatadi. Undagi ekologik tarbiyaning ilmiy asosini belgilash uchun ekologiya bo'yidagi organizmlarni yashash muhiti bilan va o'zaro munosabatlarini o'rganuvchi bioekologiya fani sifatidagi birinchi (tub) ta'rif ahamiyatlidir.

Bioekologiya bo'yidagi uchta bo'limi mavjud bo'lib, ularda o'zaro munosabatlar ko'rib chiqiladi:

1) alohida yashovchi organizmning yashash muhiti bilan aloqasi (avtokologiya);

2) areali (tarqalish hududi) turlicha bo'lgan o'simlik va hayvon turlari populyatsiyalari (demekologiya);

3) tirik organizmlar jamoalari va ular birgalikda yashaydigan muhit (sin ekologiya).

Maktabgacha yoshdagi bolalarning o'ziga xos xususiyatlarini, ularning ruhiy va shaxsiy rivojlanishining o'ziga xos xususiyatlarini hisobga olgan holda, bioekologiya bo'yidagi bo'limlari turli darajada maktabgacha yoshdagi bolalarni tarbiyalashning ekologik metodikasini yaratish uchun ilmiy asos bo'lib xizmat qilishi mumkin. Tushunchalar va ekologik materiallarni tanlash me'zonlari ikki jihatdan iboratdir:

- ularning ko'rgazmali taqdim etilishi;
- amaliy faoliyatga kiritish imkoniyati.

Maktabgacha yoshdagi bolalikda tafakkurning ko'rgazmali-harakatli va ko'rgazmali-obrazli shakllari ustunlik qiladi, ular faqat tabiat haqidagi maxsus tanlab olingan va yoshga moslashtirilgan ma'lumotlarni tushunish va o'zlashtirishlari mumkin.

Eng mos keladigan avtokologiya bo'limi - bolalar aniq, alohida olingan tirik organizmlar bilan o'rnatilgan hududdagi, ko'chadagi (uy yonidagi, bolalar bog'chasi uchastkasidagi) xona o'simliklari va o'simliklar, hamma joyda yashaydigan uy va manzarali hayvonlar, qushlar va hasharotlar bolaga ekologik nuqtayi nazardan -

ularning yashash muhiti bilan bevosita o'zaro ta'sirida tanishtirilishi mumkin. Katta odam bu o'zaro ta'sirni ko'rsatishni maqsad qilib qo'yadi va maktabgacha tarbiya yoshidagi bolalar bilan: o'simliklar va hayvonlarning yashash sharoitlari nimalardan iborat, ular bu sharoitlar bilan qanday o'zaro ta'sirda bo'ladilar, deb kuzatib boradi. Shunday qilib, metodikani tuzishda ishlatilishi mumkin bo'lgan birinchi ekologik tushuncha tirik organizmning yashash muhiti bilan o'zaro bog'liqligi tushunchasidir. Buning sababi shundaki, har qanday tirik organizmda uning ichki imkoniyatlari bilan qondirib bo'lmaydigan ehtiyojlar mavjud. Tirik organizm (tirik mavjudot, individ) ning ehtiyojlari tashqi muhit omillari bilan qondiriladi. Bu, eng avvalo, moddalar almashinuvi orqali hayotiy energiyani yaratadigan va individga hayotning barcha sohalarida o'zini namoyon qilish imkonini beradigan ozuqa moddalari, suv, kislorodga bo'lgan ehtiyojdir.

Autekologiya bo'limidan o'rin olgan navbatdagi muhim tushuncha - organizmning yashash muhitiga morfofunktsional moslashuvi (adaptatsiyasi) mohiyatan avvalgisining davomchisi yoki aynan o'xshashi hisoblanadi: u tirik mavjudotning yashash muhiti bilan o'zaro bog'liqligi mexanizmini ochib beradi, bu o'zaro bog'liqlik qanday sodir bo'ladi, degan savolga javob beradi. O'simlik va hayvonlarning tashqi morfologik (tuzilishga oid) xususiyatlari maktabgacha tarbiya yoshidagi bolaning idrokiga tushunarli bo'ladi, shuning uchun, umuman olganda, aynan misollarda ko'rsatilgan moslashuvchanlik haqidagi bilim unga tushunarli bo'lishi mumkin. Funksiyaning tashqi ko'rinishlari (hayvonlarda bu xatti-harakat) ham bolaning yaqqol obrazli tafakkuri uchun tushunarli va unga qiziqarlidir. Hayvonlarning xulq-atvori uning tuzilish xususiyatlariga to'liq mos keladi, u bunday sharoitlarda tashqi organlar (tana qismlari) bilan nima qilish mumkinligini ko'rsatadi. Kichkina bolani hayvonlar xatti-harakatining o'zgaruvchanligi ham o'ziga jalb qiladi: obrazlarning tez o'zgarishi uning hali beqaror diqqati va idrokini o'ziga osongina qaratadi, fikrlashi uchun "oziq" beradi.

Tushunchalarning mukammallashuvi yashash muhiti tushunchasi bilan uzviy bog'liqdir. Kattalar bolalar bilan o'simlik yoki hayvonning hayoti uchun nima zarurligini (substrat, suv, havo, oziq-ovqat, muayyan harorat sharoitlari va boshqalar), ular qanday buyumlar, materiallar bilan o'ralganligini, qanday xususiyatlarga ega ekanligini bemalol muhokama qilishi mumkin.

Bu tushunchalar birinchi va asosiy ekologik tushunishni ifodalaydi, ya'ni har qanday tirik organizm o'z ehtiyojlari va ularni qondirish zarurati orqali yashash muhiti bilan yashash sharoitiga morfofunktsional moslashuvchanlik (adaptatsiya) orqali bog'langan. Bu fikrni maktabgacha tarbiya yoshidagi bolaning ongiga aniq va tushunarli qilib yetkazish mumkin. Misol uchun: - Olmaxon - o'rmon hayvoni bo'lib, u haqidagi ma'lumotlarni bolalar maktabgacha yoshda oladilar. Tirik mavjudot sifatida u oziq-ovqat, havo, issiqlik va boshqalarga bo'lgan ehtiyojlarga ega bo'lib, ularni faqat o'z yashash joyida - aralash yoki ignabargli o'rmonda qondirishi mumkin. Olmaxonning yashash muhiti - bu bir-biridan ma'lum masofada o'sadigan daraxtlarning turli (mavsumga qarab) holati: yozda bargli, urug'li, mevali, qishda yalang'och va boshqa hayvonlar qorda; hayvon uchun ozuqa bo'ladigan o'simliklar (o'rmon yong'og'i, yong'oq, archa urug'i, qo'ziqorin va

boshqalar); o'rmonlar, ular orasida mavsumiy o'zgaruvchan va yirtqichlar bilan yashashini keyinchalik tushunishlari mumkin. Bu moslanish xususiyatlari olmaxonga daraxtlarda har tomonga bimalol yurish, ozuqa topish va uni yeyish, dushmanidan qochish, uya qurish va nasl qoldirish, mavsumiy harorat o'zgarishlariga qaramasdan o'troq hayvon bo'lib qolish imkonini beradi. Shunday qilib, olmaxonning yashash muhiti bilan o'zaro aloqasi amalga oshadi.

Ushbu ekologik tasavvur maktabgacha bo'lgan davrda asta-sekin shakllanishi mumkin, natijada olti-yetti yoshga kelib, bola nafaqat o'rmondagi hayvonlar hayotining aniq faktlarini o'zlashtiradi, balki hayvonning yashash muhiti bilan moslashuvchan o'zaro bog'liqligini ham tushunadi.

Xulosa. Shunday qilib, ekologiyaning bir qator tushunchalari va tirik tabiatning ba'zi ekologik qonuniyatlari maktabgacha yoshdagi bolalarni ekologik tarbiyalash metodikasi mazmunining ilmiy asosi bo'lib xizmat qiladi.

Ko'rib chiqilgan hodisalardan tashqari metodikaga insonning (tur vakili, tirik mavjudot sifatida) yashash muhiti bilan aloqasini, uning hayoti va salomatligining tashqi omillarga (havo, suv, issiqlik, oziq-ovqat va boshqalar) bog'liqligini aks ettiruvchi tushunchalarni ham kiritish mumkin. Bu ma'lumotlar inson ekologiyasi, ijtimoiy ekologiyaga bevosita aloqador. Sog'liqni saqlash, uni bolalar bog'chasi va oilada qulay turmush sharoitlarini, sog'lom turmush tarzini yaratish yo'li bilan qo'llab-quvvatlash mavzusini maktabgacha tarbiya yoshidagi bolalarning diqqat-e'tiboriga havola etish imkoniyatini beradi.

Foydalanilgan adabiyotlar

1. Николаева С.Н. Методика экологического воспитания дошкольников Учеб. пособие для студ. сред. пед. учеб. заведений. 2-е изд., испр. Издательский В центр «Академия», 2001.— 184 с.
2. Meliboyev A.R. Maktabgacha ta'limda tarbiyachilarga ekologik ta'lim berishga tayyorlashning pedagogik shart-sharoitlari. Toshkent 2014.
3. Xasanova G.I. Ta'lim jarayonida dasturlashtirilgan o'qitish texnologiyasidan foydalanishning afzalliklari. Jizzax:2020. 420 bet. 223 – 225 b.
4. Sodiqova Sh. Maktabgacha pedagogika. Darslik Toshkent-2012 yil.149-150 b.
5. Nurmamatov Z.Sh. Sun'iy intellekt orqali "Texnologiya" fani o'qituvchisining innovatsion faoliyat modelini rivojlantirish O'ZBEKISTON MILLIY UNIVERSITETI XABARLARI, 2025, [1/2] ISSN 2181-7324 UDK: 371.035:371.3 FALSAFA <http://journals.nuu.uz> Social sciences.
6. Nurmamatov Z.Sh. "Texnologiya fani darslarida o'quvchilarning ijodkorlik qobiliyatlarini rivojlantirishda robototexnikadan foydalanish" nomli electron darslik O'zbekiston Respublikasi Adliya Vazirligi huzuridagi Intellektual mulk agentligi guvohnomasi. № DGU 53805 - 18.07.2025 - y. ro'yxatdan o'tkazilgan.
7. Nurmamatov Z.Sh. Bo'lajak texnologiya fani o'qituvchilarini innovatsion faoliyatga tayyorlash jarayoni Eurasian journal of social sciences, philosophy and culture. - Angliya. volume 3 issue 1, part 2 january 2023 – y. ISSN 2181-2888 page 138-142
8. Nurmamatov Z.Sh. Ta'limdagi taraqqiyotni tezlashtirish uchun innovatsiyalar va texnologiyalardan foydalanish Innovations in technology and science education

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AHOLINI FAVQULODDA VAZIYATLARDA HARAKAT QILISHGA TAYYORLASHDA INNOVATSION TIZIMLARNING JORIY ETILISH TARIXI

Annotatsiya: Favqulodda vaziyatlar soni va ko'lami ortib borish ehtimoli yuqori blgan hozirgi zamonda aholini favqulodda vaziyatlarda harakat qilishga tayyorlash masalasi borgan sari muhim ahamiyat kasb etmoqda. So'nggi yillarda aholini favqulodda vaziyatlarda harakat qilishga tayyorlashning yangi usullari shakllanib, amaliyotga joriy etilib borilmoqda.

Ushbu maqolada O'zbekiston Respublikasi mustaqilligi yillarida aholini favqulodda vaziyatlarda harakat qilishga tayyorlash tarixi, bu qisqa muddat davomida innovatsion tizimlarning joriy etilish tarixi kesimida yoritilgan.

Kalit so'zlar: tarix, favqulodda vaziyat, tayyorlash, simulyatsiya, simulyator, o'qitish, innovatsiya.

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THE HISTORY OF IMPLEMENTING INNOVATIVE SYSTEMS IN PREPARING THE POPULATION TO ACT IN EMERGENCY SITUATIONS

Abstract: In modern conditions, when the probability of an increase in both the number and scale of emergency situations is high, the issue of preparing the population to act in emergencies is becoming increasingly important. In recent years, new methods for preparing the population to act in emergency situations have begun to take shape, and these methods are being gradually introduced into practice.

This article highlights the history of preparing the population to act in emergency situations during the years of independence of the Republic of Uzbekistan, examined through the lens of the history of implementing innovative systems over this relatively short period.

Keywords: *history, emergency situation, preparedness, simulation, simulator, training, innovation*

Ishlab chiqarish texnologiyalari takomillashgan sari tabiiy va texnogen xususiyatli favqulodda vaziyatlar soni va turi ortib borishi ehtimolidan hamda aholini bunday turdagi favqulodda vaziyatlarga tayyorlash lozimligidan kelib chiqib, 1996-yilda Favqulodda vaziyatlar vazirligi tizimida 1996-yilda Fuqaro muhofazasi instituti, joylarda esa aholi va rahbar xodimlarni tayyorlash markazlari tashkil etiladi. 1997-yilda aholini favqulodda vaziyatlarda harakat qilishga tayyorlash yuzasidan Vazirlar Mahkamasining qarori qabul qilinib, unda ishlab chiqarish va xizmat ko'rsatish sohalarida band bo'lgan aholi, rahbar xodimlar va mutaxassislar hamda ishlab chiqarish va xizmat ko'rsatishda band bo'lmagan aholini favqulodda vaziyatlarda harakat qilishga tayyorlash vazifasi qo'yiladi [2].

Aholini tayyorlash ishlari 2011-yilga qadar oddiy – an'anaviy usullardan foydalangan holda tashkil etildi. Faqat shu yilga kelibgina sinf xonalari kompyuter va proyektorlar bilan ta'minlandi. Shu yili sinf xonalar qo'shimcha ravishda O'zbekiston Respublikasining relefli xaritasi, kimyoviy xavfli ob'ekt maketlari bilan ta'minlana boshlandi. Keyinchalik kompyuter yordamida test olish tartibi yo'lga qo'yilib, kompyuter sinfi tashkil etildi va ular yetarli miqdorda kompyuterlar bilan ta'minlandi.

Shu yili Vazirlar Mahkamasining aholini tayyorlashga oid muhim qarori qabul qilindi [3]. Ushbu qaror talablarini bajarish, aholini favqulodda vaziyatlarda harakat qilishga tayyorlash saviyasini yangi bosqichga ko'tarish maqsadida Fuqaro muhofazasi institutida zilzilani simulyatsiya qilish markazi qurish vazifasi qo'yildi. Buni amalga oshirish uchun uzoq muddat davomida 20 dan ortiq davlatlarning tajribasi chuqur o'rganildi. Nihoyat Yaponiyadagi dunyoda yagona bo'lgan zilzilani simulyatsiya qilish majmuasi tanlab olindi. Yaponiyada shunday kompleks yaratilganki, ushbu kompleks zilzilani simulyatsiya qurilmasidan tashqari, zilzila tarixi muzeyi va boshqalarni o'z ichiga oladi. Bizda ham xuddi shunday markaz qurishga qaror qilindi. Markazni qurish ishlariga BMTning tarraqiyot dasturi hamda gumanitar yordam bo'yicha Yevropa komissiyasi departamenti (ECHO) 2 milliard so'm miqdorida mablag' ajratdi.

Mavjud simulyatsiya markazlari va imkoniyatlar o'rganilib, chet ellik hamkorlar bilan kelishuvlar va loyihalash ishlari yakuniga yetkazilgach 2014-yil 20- avgust kuni zilzilani simulyatsiya qilish markazini qurilish ishlari boshlandi.

Zilzilani simulyatsiya qilish markazi "Zilzila tarixi muzeyi", "Birinchi tibbiy yordam sinfi", "Ekspozitsiya zali", "Zilzila simulyatori–trenajyori", "Relaksatsiya sinfi", "Konferetsiya zal"laridan iborat qilib belgilandi. Markaz tarkibiy qismlarini shakllantirish uchun O'zbekiston tarixi muzeyi, Seysmologiya institutlarining katta tajribaga ega bo'lgan xodimlari bilan maslahatlashuvlar olib borildi. Qurilish ishlari jadal suratlar bilan olib borilib, 2015-yilning 13-yanvar kuni markaz foydalanishga topshirildi. Markaz ochilishida Birlashgan millatlar tashkiloti taraqqiyot dasturining, O'zbekiston Respublikasi vazirlar mahkamasining vakillari ishtirok

etishdi. Markazning barcha tarkibiy qismlari zarur jihozlar bilan, yuqori didda jamlandi.

Markazning asosiy tarkibiy qismi zilzilani simulyatsiya qilish xonasi hisoblanadi. Xona odatiy tarzda jihozlangan bo'lib, u kompressorlar yordamida harakatga keladigan uchta tayanchga o'rnatilgan. Tayanchga o'rnatilgan xona kompressorlar yordamida harakatga kelib zilzilani simulyatsiya qilib beradi. Kompressorlarni harakatga keltiruvchi kompyuter tizimi yer yuzida avval sodir bo'lgan barcha kuchli zilzilalarni simulyatsiya qilish imkonini beradi.

Fuqaro muhofazasi institutida zilzilani simulyatsiya qilish markazining qurilishi natijasida ko'plab aholini favqulodda vaziyatlarda harakat qilishga tayyorlash imkoni paydo bo'ldi. Bunday simulyatsiya markazlari viloyatlarda ham mavjud bo'lganida juda ko'p miqdordagi aholini favqulodda vaziyatlarda harakat qilishga tayyorlash imkoni paydo bo'lgan bo'lar edi. Shuni hisobga olib, 2020-yilda ko'chma zilzila simulyatori yaratildi.

PF-2 avtomobil pritsepi shassisiga mebellar bilan jihozlangan xona maketi joylashtirildi. Ushbu xona prujinalar va boshqa zarur moslamalar bilan shassiga o'rnatildi. U elektrodvigatel yordamida harakatga keltiriladi.

Simulyatorga odamlar chiqarilib, elektr manbaiga ulanadi va simulyator harakatga keltiriladi. Uning ichidagi odamlar tebranish paytida to'g'ri harakatlarni amalga oshiradilar. Shunday tartibda aholi tayyorgarlikdan o'tkaziladi.

2019-yilda aholini favqulodda vaziyatlarda harakat qilishga tayyorlash yuzasidan yangi qaror ishlab chiqildi. Unda quyidagi toifalar tayyorgarlikdan o'tkazilishi belgilab berildi:

- chiqarish va xizmat ko'rsatish sohalarida band bo'lgan aholi, shu jumladan, davlat boshqaruvi organlari, mahalliy ijroiya hokimiyati organlari, boshqa tashkilotlar rahbarlari, xodimlari, ishchi va xizmatchilari hamda O'zbekiston Respublikasi Qurolli Kuchlarining harbiy xizmatchilari (keyingi o'rinlarda harbiy xizmatchilar deb ataladi);

- maktabgacha ta'lim muassasalari tarbiyalanuvchilari, umumiy o'rta ta'lim maktablari va o'rta maxsus, professional ta'lim muassasalari o'quvchilari hamda oliy ta'lim muassasalari talabalari;

- ishlab chiqarish va xizmat ko'rsatish sohalarida band bo'lmagan aholi, shu jumladan, jismoniy imkoniyati cheklangan shaxslar hamda O'zbekiston Respublikasiga tashrif buyurgan turistlar.

Ushbu qarorda aholini tayyorlashda innovatsion usullardan keng foydalanish lozimligi belgilab qo'yildi [4].

Favqulodda vaziyatlarda harakat qilishga tayyorlanishi lozim bo'lgan toifalarning xilma-xilligi o'qitish ishlarini qiyinlashtiradi. Shundan kelib chiqib, aholining imkon darajasida keng qatlamlarini favqulodda vaziyatlarda harakat qilishga tayyorlash maqsadida 2020-yilda institutning zilzilani simulyatsiya qilish markazi to'liq qayta ta'mirlanib, mazkur markaz faoliyati favqulodda vaziyatlar tasnifi to'g'risidagi qarorga[1] mos holatga keltirilib, avvalgidan ancha kengaytirildi. Markaz boshqa turdagi favqulodda vaziyatlarda ham to'g'ri harakat qilishga amaliy jihatdan tayyorlashga mo'ljallangan interaktiv o'quv sinflaridan

iborat kompleksga aylantirildi hamda nomlanishi «Favqulodda vaziyatlar simulyatsiya markazi» deb o'zgartirildi.

Markazning o'quv yo'nalishi fuqarolarni tabiiy va texnogen xususiyatli favqulodda vaziyatlarda to'g'ri harakat qilishni qamrab olgan fan va mavzular bo'yicha nazariy bilim berish hamda amaliy ko'nikmalarni oshirishga mo'ljallangan.

Simulyatsiya markazining zilzilalar tarixi muzeyi. Muzeyda zilzilalarning shakllanish sxemasi, O'zbekiston Respublikasining seysmik rayonlashtirish xaritasi, har xil davrlarda ishlatilgan seysmik asbob-uskunalar (seysmoskop, optik magnitometr, Nikiforov seysmometri, Golitsyn seysmografi, mexanik seysmometr, Seysmopriyemnik S5S va boshqalar) bilan ham tanishish mumkin.

Muzeyda ilgari sodir bo'lgan kuchli zilzilalar – 1902-yil 16-yanvardagi Andijon zilzilasi, 1906-yil 18-apreldagi San-frantsisko zilzilasi, 1948-yil 6-oktyabrdagi Ashxobod zilzilasi, 1995-yil 17-yanvardagi Kobe zilzilasi, 1999-yil 17-avgustdagi Izmit zilzilasi 2004-yil 26-dekabrdagi Sumatra zilzilalari to'g'risida batafsil ma'lumot berilgan [5].

Muzey 1966-yildagi Toshkent zilzilasi aks ettiruvchi fotokollaj bilan boyitilgan. Fotokollajda zilzila sodir bo'lgan kun, shaharning tiklanish bosqichlari va uning hozirgi ko'rinishi aks ettirilgan.

Simulyatsiya markazining xabar berish va aloqa sinfi. Sinf telefon va har xil turdagi favqulodda vaziyatlar aks ettirilgan maxsus kioskalardan tashkil topgan. Bu joyda favqulodda vaziyat sodir bo'lganda har xil xizmatlarga xabar berish tartibi o'rgatiladi.

Simulyatsiya markazining zilzila simulyatori. Zilzila simulyatori – ichida bemalol joylashish imkoni mavjud bo'lgan, turar joy xonasi ko'rinishida to'liq jihozlangan, har xil kuchdagi zilzilani aks ettirib bera oladigan maxsus xona. Simulyatordan foydalanishdan maqsad zilzila tebranishlarini hosil qilish va tashrif buyuruvchilarga xonaning xavfsiz joyini topib, shu joyga joylashishdan iborat.

Devorlarga butun dunyoda sodir bo'lgan kuchli zilzilalar aksi tushirilgan plakatlar joylangan bo'lib, ularda aks ettirilgan barcha zilzilalar kompyuterda dasturlangan. Tashrif buyuruvchilarning xohishidan kelib chiqib, ushbu zilzilalarning tebranishlari sun'iy tarzda hosil qilinishi mumkin.

Simulyatsiya markazining relaksatsiya sinfi. Favqulodda vaziyatlar xavfi tug'ilganda va sodir bo'lganda odam kuchli stressni boshidan o'tkazadi. Bunda zo'riqishdan qutilishning yagona chorasi relaksatsiya usullaridan foydalanish hisoblanadi. Relaksatsiya yordamida odam stressni nazorat qilishi, tezda quvvatini tiklab olishi mumkin.

Relaksatsiya sinfida tinglovchi tinchlantiruvchi musiqa eshitishi, har xil manzaralarni tomosha qilishi mumkin.

Simulyatsiya markazining bilim va ko'nikmalarni tekshirish sinfi. Sinf fuqaro muhofazasi sohasidagi test savollari kiritilgan planshet bilan jihozlangan. Savollar ham kattalarga, ham bolalarga mo'ljallangan.

Simulyatsiya markazining yong'in xavfsizligi sinfi. Sinf birlamchi o't o'chirish vositalari bilan jihozlangan. Yong'in holatlari aks ettirilgan. Ushbu sinf

tinglovchilarni 3D virtual ko'zoynaklari yordamida yong'in sodir bo'lganda harakat qilish qoidalarini o'rganishga mo'ljallangan.

Simulyatsiya markazining texnogen xususiyatli favqulodda vaziyatlar sinfi. Sinf devorlarida texnogen xususiyatli favqulodda vaziyatlar – transportdagi, ob'ektdagi, gidrotexnika inshootlaridagi avariylar, bino va inshootlarning qulab tushishi, zilzila oqibatlari aks ettirilgan. Bu joyda, shuningdek, 3D virtual ko'zoynaklari ham mavjud bo'lib, tinglovchilar uning yordamida ob'ektda avariya sodir bo'lganda hududdan chiqib ketish usulini mashq qiladi.

Simulyatsiya markazining tabiiy xususiyatli favqulodda vaziyatlar sinfi. Sinf tabiiy xususiyatli favqulodda vaziyatlarda harakat qilishni o'rgatishga mo'ljallangan bo'lib, bu joyda tinglovchilar ko'chki, sel va boshqa tabiiy xususiyatli favqulodda vaziyat bilan tanishadi hamda hodisa sodir bo'lganda qanday harakat qilishni o'rganadi.

Simulyatsiya markazining ekologik xususiyatli favqulodda vaziyatlar sinfi. Sinf ekologik xususiyatli favqulodda vaziyatlar bilan tanishtirish va bunday vaziyatlarda harakat qilishga tayyorlashga mo'ljallangan. Bu joyda O'zbekiston Respublikasining ekologik muvozanatida muhim o'rin tutuvchi Orol dengizining avvalgi va hozirgi holati hamda kimyoviy xavfli ob'ektlar haqida, zaharli chiqindi va gazlarning ta'siri, o'rmon yong'inlari haqida tushuncha beriladi. Bu joyda 3D ko'zoynak yordamida Orol dengizining qurish jarayonini kuzatish mumkin.

Simulyatsiya markazining radiatsion, kimyoviy va tibbiy-biologik muhofaza sinfi. Sinf turli atom elektr stantsiyalaridagi avariylar, ionlashtiruvchi nurlanishlarning inson organizmiga ta'siri, qutqaruv tuzilmalarida mavjud bo'lgan radiatsion, kimyoviy muhofaza jihozlari, yirik kimyoviy avariylar va ularning oqibati, individual himoya vositalari aks ettirilgan rasmlar bilan jihozlangan bo'lib, tinglovchilarni radiatsion, kimyoviy va tibbiy-biologik favqulodda vaziyatlarda harakat qilishga tayyorlashga mo'ljallangan.

Simulyatsiya markazining tibbiy tayyorgarlik sinfi. Ushbu sinf aholiga tibbiy yordamni tashkil etish haqida tushuncha berish va favqulodda vaziyatlarda jabrlanganlarga birinchi yordam ko'rsatish bo'yicha tayyorlashga mo'ljallangan bo'lib, sinf birinchi yordam ko'rsatishga oid rasmlar, jihozlar hamda maxsus "Gosha" tibbiy trenajyori bilan jihozlangan.

Simulyatsiya markazining "Lift" o'quv mashq moduli. Ma'muriy va turar joylarda liftlardan xavfsiz foydalanish tartibini namoyish qilishga mo'ljallangan.

Simulyatsiya markazining tutunli sinfi. Tutunli sinf – tutun bosgan joydan chiqib ketish va evakuatsiya qilish tartibini o'rgatishga mo'ljallangan maxsus labirint xona. O'qitish jarayonida ushbu labirint tutun bilan to'ldiriladi.

Favqulodda vaziyatlar simulyatsiya markazining faoliyati tarixi. Favqulodda vaziyatlar simulyatsiya markazi aholini favqulodda vaziyatlarda harakat qilishga tayyorlashda alohida o'rin tutadi. Chunki, ushbu markazda bo'lgan har bir kishi zilzilani simulyatsiya qilish qurilmasi yordamida zilzilaning haqiqiy kuchini boshidan o'tkazadi. Tutunli xona orqali o'tib, haqiqiy yong'inni va tutunini his qiladi va hokazo. Shuning uchun favqulodda vaziyatlarda simulyatsiya markazi

aholini tayyorlashda muhim o‘rin tutadi. Qolaversa, bunday qurilmaga ega bo‘lgan kompleks dunyoning sanoqli davlatlaridagina mavjud.

Fuqaro muhofazasi instituti tomonidan aholini favqulodda vaziyatlarda harakat qilishga tayyorlash natijalari tahlil qilinganda shu narsa aniqlandiki, institutda fuqaro muhofazasi yo‘nalishida tayyorlanganlar soni 2018-2023-yillar davomida 11836 kishini tashkil etgan.

Zilzilani simulyatsiya qilish markazida esa bu ko‘rsatkich 18837 kishini tashkil qilgan. Markazda tayyorgarlikdan o‘tganlar soni fuqaro muhofazasi kurslaridagiga nisbatan 159 %ni tashkil qilgan.

Bundan tashqari simulyatsiya markazida tayyorgarlikdan o‘tkazilganlardan 5571 nafari (29%) maktab o‘quvchilari va talabalardan iborat bo‘ldi. 2023-yilda 244 nafar (5%) chet mamlakatlar vakolatxonalarining xodimlar tayyorgarlikdan o‘tishdi. Bu shundan dalolat beradiki zimmasiga fuqaro muhofazasi sohasida bilim olish va tarqatish vazifasi yuklatilmaganlar orasida ham simulyatsiya markaziga qiziqish bildirganlar ko‘p bo‘lgan [6].

Xulosa qilib shuni aytish mumkinki, O‘zbekiston Respublikasida innovatsion usullar yordamida aholini favqulodda vaziyatlarda harakat qilishga tayyorlash ishlariga nisbatan kech kirishilgan. Biroq shunga qaramay favqulodda vaziyatlar simulyatsiyasi markazi, uning har xil vaziyatlarni aks ettiruvchi tarkibiy qismlari yordamida katta miqdordagi aholini tayyorlashga erishilgan. Bundan tashqari barcha darslar amaliy hamda ko‘rgazmali bo‘lganligi bois odamlarda hosil bo‘ladigan taassurot hisobiga dars natijalari samarali bo‘lgan.

Foydalanilgan adabiyotlar:

1. O‘zbekiston Respublikasi Vazirlar Mahkamasining 1998-yil 27-oktyabrdagi “Favqulodda vaziyatlar tasnifi to‘g‘risida”gi 455-sonli qarori
2. O‘zbekiston Respublikasi Vazirlar Mahkamasining 1998-yil 7- oktyabrdagi O‘zbekiston Respublikasi aholisini favqulodda vaziyatlardan muhofaza qilishga tayyorlash tartibi to‘g‘risida 427-sonli qarori
3. O‘zbekiston Respublikasi Vazirlar Mahkamasining 2011-yil 19-iyuldagi “Aholini zilzilalar oqibatida yuzaga kelgan favqulodda vaziyatlarda (tabiiy va texnogen xususiyatli) harakat qilishga tayyorlash kompleks dasturini tasdiqlash to‘g‘risida”gi 208-sonli qarori
4. O‘zbekiston Respublikasi Vazirlar Mahkamasining 2019-yil 9- sentyabrdagi “Aholini favqulodda vaziyatlarda harakat qilishga va fuqaro muhofazasi sohasida tayyorlash tartibini takomillashtirish to‘g‘risida”gi 754-sonli qarori
5. Abdullabekov Q. Ilyasova Z. // Favqulodda vaziyatlar tarixidan: Zilzila. // - T.: FMI kichik bosmaxonasi, 2016. – 164 b.
6. Fuqaro muhofazasi instituti tomonidan 2018-2023-yillar davomida amalga oshirilgan asosiy tadbirlar hisobotlari

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ULÍWMA ORTA BILIM BERIW MEKTEPLERINDE EKONOMIKALÍQ PÁNLERDI OQÍTÍWDA INTERAKTIV METODLARDAN PAYDALANIWDIŇ ÓZINE TÁNLIĞI

Annotaciya: *Interaktiv metodlar bilim beriw procesinde oqıtıwshı hám oqıwshılar ortasındaǵı jedel birge islesiwdi támiyinlep, oqıwshılardıń bilimlerdi tez hám nátiyjeli ózlestiriwine xızmet etedi. Bul metodlar oqıwshılardıń erkin pikirlewin hám de jeke qábiletlerin rawajlandırıwǵa keń imkaniyat jaratadı. Bul maqalada ekonomikalıq pánler sabaqlarında nátiyjeli qollanıwı múmkin bolgan interaktiv metodlar kórsetip beriledi.*

Tayanış sózler: *ekonomika, metod, interaktiv, bilim, kónlikpe, tájiriyebe, pedagogikalıq texnologiya, nátiyjelilik.*

Kirisiw

Búgingi globalıw hám sanlı ekonomika shárayatında bilimlendiriw sistemasın tıp-tiykarınan reformalaw, onı zamanagóy talaplar tiykarında rawajlandırıw mámleketlik siyasatıń tiykarǵı baǵdarlarınan biri esaplanadı. Ásirese, Ózbekstan Respublikasında ulıwma orta bilim beriw mekteplerin zaman talapları tiykarında jańalaw, bilimlendiriwdiń sapasın arttırıw hám ósip kiyatırǵan jas áwladtı ruwxıy-ádep-ikramlılıq hám intellektuallıq jaqtan bárkamal shaxs sıpatında tárbiyalaw úlken áhmiyetke iye bolmaqta.

Usı kózqarastan, oqıw-tárbiya procesin sapa jaǵınan jańa basqıshqa kóteriw, bilimlendiriw procesine innovaciyalıq túr hám usıllardı engiziw, pedagogikalıq tarawlarda aldınǵı sırt el tájiriybelerin qollanıw áhmiyetli wazıypalardan biri sıpatında qaralmaqta. Ózbekstan Respublikası Prezidentiniń 2018-jıl 5-sentyabrdegi “Xalıq tálimin basqarıw sistemasın jetilistiriw boyınsha qosımsha is-ilájlar haqqında”ǵı PP-5538-sanlı Pármanında[1] ulıwma orta hám mektepten tisqari bilimlendiriw sistemasın basqarıwdıń zamanagóy mexanizmlerin engiziw, bilimlendiriw mákemeleriniń jumıs nátiyjeliligin arttırıw, pedagog kadrlardıń kásiplik kompetenciyların rawajlandırıw hám bilimlendiriw procesinde innovaciyalıq kózqaraslardı keńnen engiziw wazıypaları belgilep berilgen.

Usı Pármannıń talaplarınan kelip shıqqan halda, bilimlendiriw procesin innovaciyalıq kózqaraslar tiykarında shólkemlestiriw, oqıwshılardıń erkin pikirlew, dóretiwshilik hám sın kózqarastan pikirlewdi rawajlandırıwǵa baǵdarlangan nátiyjeli pedagogikalıq texnologiyalardı engiziw ilimiy-pedagogikalıq izertlewlerdiń áhmietli baǵdarlarınan biri bolıp qalmaqta.

Tiykargı bólim

Hár bir insan ómirinde ekonomika áhmiyetli orın tutar eken, tábiyiy hár bir insannan ekonomikalıq pikirlewdi úyreniw talap etiledi. Bazar ekonomikası shárayatında bul talap jáne de kúsheyip barmaqta. Jaslarımızdın ekonomikalıq sawatlılıgın arttırıw ushın elimizde ulıwma orta bilim beriw mekteplerinde “Ekonomikalıq bilim tiykarları” hám “Isbilermenlik tiykarları” pánleri oqıtılıp kelinbekte. Barlıq tarawlarğa innovaciyalıq ideyalar, pikirler kirip kelmekte. Pánler sistemasındağı jańalıqlar, sabaq ótiwdin jańa usılları, jańa pedagogikalıq texnologiyalar arqalı sabaq procesiniń sapası, mazmunı hám qızıqlılıgı oqıwshılardıń da itibarın tartpaqta. Házirgi kúnde mámleketimizdin barlıq mekteplerinde óz jumısın alıp barıp atırǵan muǵallimler zamanagóy oqıtıw metodların basqıshpa-basqısh jaratıp, sabaqlardı shólkemlestiriwde túrli interaktiv usıllardan paydalanıp kelmekte.

Oqıtıwdın zamanagóy metodların qollanıw oqıtıw procesinde joqarı nátiyjelilikke erisiwge alıp keledi. Bul metodlardı hár bir sabaqtın didaktikalıq wazıypasınan kelip shıǵıp tańlaw maqsetke muwapıq boladı. Dástúriy sabaq túrin saqlap qalǵan halda onı bilim alıwshılardıń jumısın aktivlestiretuǵın hár qıylı metodlar menen bayıtıw, bilim alıwshılardıń ózlestiriw dárejesiniń ósiwine alıp keledi.

Interaktiv metodlardı qollanıwda eń tiykargı roldi muǵallimniń ózi atqaradı. Bir qatar rawajlangan mámleketlerde tálim-tárbiya procesiniń nátiyjeliligine kepillik beretuǵın zamanagóy pedagogikalıq texnologiyalardı qollanıw boyınsha úlken tájiriye tiykarların payda etiwshi metodlar interaktiv metodlar atı menen atalıp kelmekte. Interaktiv metodlar házirgi waqıtta eń kóp tarqalgan hám barlıq túrdegi bilimlendiriw tarawlarında keń qollanılıp atırǵan metodlardan esaplanadı. Sonın menen birge, interaktiv metodlardın túrleri kóp bolıp, tálim-tárbiya procesiniń derlik barlıq wazıypaların ámelge asırıw maqsetleri ushın sáykesleri házirgi waqıtta ámelde qollanılıp kelinbekte. Innovaciyalıq texnologiyalar pedagogikalıq process hám de muǵallim hám oqıwshı ortasında jańalıq, ózgerisler kirgiziw bolıp, onı ámelge asırıwda tiykarınan interaktiv metodlardan paydalanıladı.

Ulıwma orta bilim beriw mekteplerinde “Ekonomikalıq bilim tiykarları” hám “Isbilermenlik tiykarları” pání oqıwshılardı talap hám usınıs nızamı, óndiris hám onıń faktorları, tutınıwshılardıń dáramatları hám qárezetleri, ekonomikalıq qarar qabıl etiw, isbilermenliktiń mazmun-mánisi, jeke tártiptegi isbilermenlik, mikrofirma hám kishi kárxanalar, salıqlar haqqında, marketing haqqında, miynet resursları, bank kreditleri hám basqa tiykargı túsinipler úyretip barıladı. Bul oqıwshılardı ekonomikanıń qalay islewin, bazarǵa qanday faktorlar tásir etiwini hám turmista qanday ekonomikalıq qararlar qabıl etiwini túsiniwge, byudjetti basqarıw, procentlerdi túsiniw, kredit hám investiciyalar sıyaqlı turmıstın finanslıq táreplerin túsiniw barıwına járdem beredi. Bul kónlikpeler jaslarımız qaysı tarawdı iyelese de, keleshekte qıyın ekonomikalıq jaǵdaylardı túsiniwge járdem beretuǵın qararlar qabıl etiw hám tabıslı finanslıq turmıs keshiriw ushın júdá áhmiyetli. Sonın ushın “Ekonomikalıq bilim tiykarları” hám “Isbilermenlik tiykarları” pánlerin

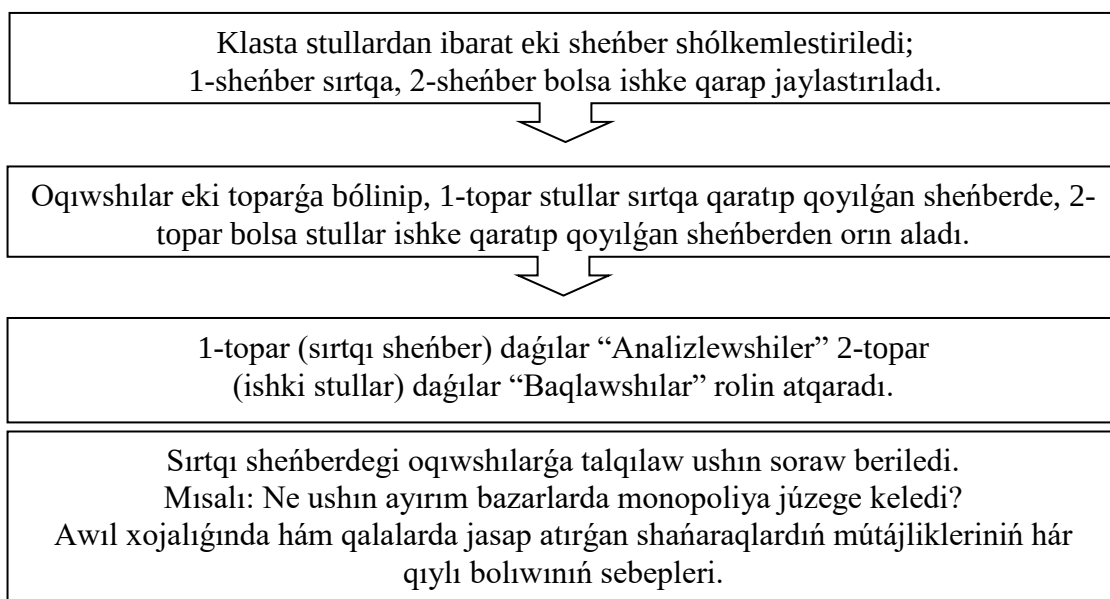
interaktiv metodlar hám texnologiyalardan paydalanǵan halda hár bir temaǵa sapalı tárizde bilim berip barıw oqıwshılardı tez hám ańsat túsiniwine imkaniyat jaratadı.

Bunda, pánge sáykes kóplegen metodlardan paydalanıw múmkin. Ásirese, rolly oyunlar metodınan paydalanılsa maqsetke muwapıq boladı. Bunda oqıwshılar isbilermen, tutınıwshı yamasa mámleketlik xızmetker rollerin atqarıwı múmkin. Rolly oyunlar metodınan paydalanıwda “Ayırbaslaw hám pul”, “Sheklengenlik mashqalası”, “Bazar qatnasıwshıları”, “Isbilermenlik”, “Firmanı basqarıw-menedjment”, “Marketing”, “Jeke tártiptegi isbilermenlik” hám basqa da temalardı misal retinde keltiriw múmkin. Temalar álbette real turmısqa baylanıslı bolıwı kerek. Rol arqalı oqıwshılar ózleriniń keleshekтегі iskerligin kóz aldına keltiredi. Bul metod sabaq dawamında qısqa waqıt ishinde temanı nátiyjeli ózlestiriwlerine alıp keledi. Baqlap otırǵan oqıwshılar sabaqtan keyin tema ústinde talqılawlar alıp barıwı ushın ayırım máselelerdi juwapsız qaldırıw hám tapsırma sıpatında beriw de múmkin. Bul metodta oqıwshılar tómendegi bilim hám kónlikpelerge iye boladı: óndiriske baylanıslı máseleler túsiniklerine iye boladı, qánigeliklerin asıradı; jaǵdaylar boyınsha óz betinshe qararlar qabıl etiw hám óz pikirlerin ayta alıw qábiletine iye boladı; jaǵdaydı talqılawdı úyrenedi; jaǵdaydan shıǵıw rejesi hám strategiyasın islep shıǵıwdı úyrenedi.

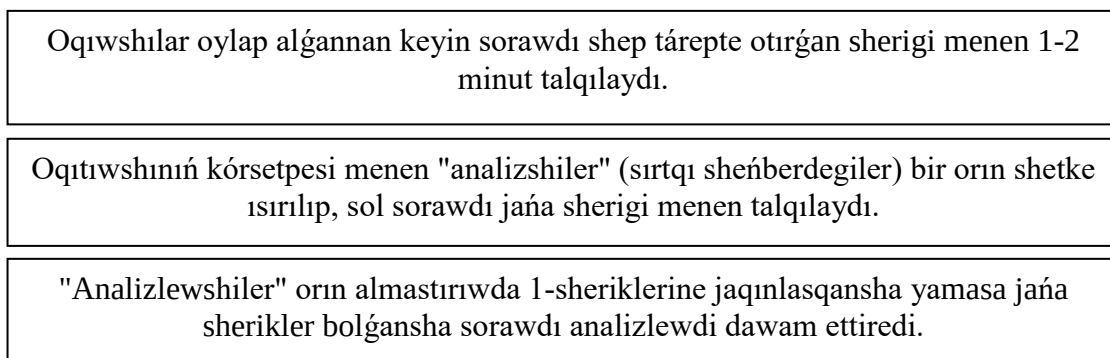
Interaktiv bilim beriw procesinde oqıw iskerligi individual, juplıq hám kishi toparlar tiykarında sistemalı túrde shólkemlestiriledi. Bunda oqıwshılardıń bilimlendiriw procesindegi belsendiligi, erkin pikirlew qábileti hám birgelikte islew kónlikpelerin rawajlandırıwǵa ayrıqsha itibar qaratıladı. Bilimlendiriw nátiyjeliligin arttırıw maqsetinde oqıw procesinde zamanagóy interaktiv metodlardan paydalanıladı. Atap aytqanda, “Vertushka”, “Akvarium”, “Aqılıy hújim” metodları oqıwshılardıń sın kózqarastan hám dóretiwshilik pikirlewin rawajlandırıw, sóylesiw mádeniyatın qalıplestiriw hám de jámaátlik jumıstı nátiyjeli shólkemlestiriwge xızmet etedi.

“Vertushka” metodında toparlarǵa material tarqatıladı hám Hár bir topar jeke tártipte durıs juwaplardı jazıp belgileydi. Keyin bul materiallar toparlarǵa aralastırılıp beriledi, jáne belgilenedi. Toparlar sanına qarap aylanǵannan keyin muǵallım hám oqıwshılar menen birgelikte durıs juwap belgilenedi. Alıp barıw texnologiyası: Bul metodtı alıp barıw ushın A4 formattaǵı aq qaǵaz hám temaǵa tiyisli kórgizbeli qurallar kerek boladı. Oqıwshılar úsh toparǵa ajratıladı, A4 formattaǵı qaǵazǵa 8-klass “Ekonomikalıq bilim tiykarları” páninen “sheklengenlik mashqalası” temasınan sorawlar jazıladı: mútájlik; ekonomikalıq resurslar; ekonomikalıq ónimler; sheklengenlik mashqalası. Bulardıń hámмесine topar aǵzaları másláhátlesip durıs juwaplardı jazıp belgilep beredi, keyin bul sorawlar basqa toparlarǵa almastırılıp berilip topar aǵzaları óz pikirlerin jazıp belgilep beredi. Eń aqırında muǵallım menen birgelikte bul sorawlardıń anıq durıs juwapları belgilenedi hám topar aǵzaları bahalanadı.

“Akvarium” - bilim beriw procesinde bul texnologiyanı qollanıwdan maqset oqıwshını belgili bir mashqala boyınsha pikirlew, óz pikirin bildiriw, mashqalanı sherigi menen birgelikte talqılawǵa úyretiwden ibarat. Metodtı qollanıwda tómendegi shólkemlestiriwshilik háreketler quraydı:[2]



Metodtı qollanıw tártibi tómendegishe:



Túsindirme: Analizlewshilerdiń tiykarǵı wazıypası soraw haqqında talqılawdı dawam ettiriw, baqlawshılardıń tiykarǵı wazıypası bolsa 1-topar (Analizlewshiler) jumısların baqlap bahalawdan ibarat.

“Aqlıy hújim” metodı járdeminde orınlangan shınıǵıwlar procesinde qálegen mashqalalarǵa qaray bir neshe original sheshimlerdi tabıw imkanıyatı payda boladı. Bul metod tańlangan temalar sheńberinde tiykarǵı túsiniqlerdi anıqlaw, bar ideyalardı analizlew hám eń maqul variantlardı tańlap alıw ushın qolaylı shárayat jaratadı.

Mısal ushın, bul aqlıy hújim metodınan “Ekonomikalıq bilim tiykarları” hám “Isbilermenlik tiykarları” pánleriniń barlıq temalarında paydalanıw múmkin. Ekonomikalıq bilim tiykarları páninde “Jalpı dáramat”, “Payda hám ziyan” temasına mısal keltirip tómendegilerdi kóriwimiz múmkin:

- payda menen dáramattıń qanday parqı bar?
- paydanıń isbilermenlik ushın áhmiyetin kórsetiwshi eki faktordı aytıń?
- firmanın ekonomikalıq jaǵdayın nelerden biliwimiz múmkin?
- tovar bahasın túsirip te paydanı kóbeytiw múmkin be?
- firma paydası qanday maqsetlerde paydalanıladı? sıyaqlı sorawlardı bersek, olardı sabaq waqtında berilgen sorawlarǵa oylanıwǵa shaqırǵan bolamız. Demek,

“Ekonomikalıq bilim tiykarları” hám “Isbilermenlik tiykarları” sabaqlarında bul metod arqalı temanı jáne de bekkemlewge erisken bolamız.

Juwmaqlaw

Juwmaqlap aytqanda, sabaq ótiw procesinde bilim beriwdiń interaktiv metodlarınan ónimli paydalanıw, ótilgen materiallardı jaqsı eslep qalıwǵa, óz betinshe pikirley alatuǵın oqıwshınıń qáliplesiwine járdem beredi. Oqıwshılar interaktiv metodlar járdeminde ekonomikada júz beretuǵın real proceslerdi túsiniw baradı. Interaktiv metodlardıń tiykarǵı abzallıǵı sonda - teoriyalıq bilimlerde ámeliyatta qollanıw qábiletine iye boladı. Ekonomikalıq pánlerde interaktiv metodlardan paydalanıw házirgi waqıtta keń tarqalǵan bolıp, bul metodlar oqıwshılardıń óz ústinde islewine, durıs pikirlewine, keleshekte turmısta durıs ekonomikalıq qararlar qabıl etiwine járdem beredi.

Adabiyotlar

1. O‘zbekiston Respublikasi Prezidentining 2018-yil 5-sentabrdagi “Xalq ta’limini boshqarish tizimini takomillashtirish bo‘yicha qo‘shimcha chora-tadbirlar to‘g‘risida”gi PF-5538-son Farmoni
2. Interfaol metodlar: mohiyati va qo‘llanilishi \ Metodik qo‘llanma. D.Ro‘zieva, M.Usmonboyeva, Z.Xolipova. – Toshkent: Nizomiy nomidagi TDPU nashriyoti, 2013 y.
3. U.Q.Tolipov, M.Usmonboeva – Pedagogik texnologiyalarning tatbiqiy asoslari. «Fan» 2006 y.
4. Nizomiy nomidagi TDPU. Interfaol metodlar: mohiyati va qo‘llanilishi. (metodik qo‘llanma) 2013-y.

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KUYDIRGI KASALLIGI BO'YICHA EPIZOOTIK HOLATNI NAZORAT QILISH VA OLDINI OLIISHDA TADBIRLARI

Anotatsiya. Ushbu maqolada kuydirgi (sibir yarasi) kasalligining epizootik holatini nazorat qilish va uning oldini olishga qaratilgan kompleks tadbirlar tahlil qilingan. Kuydirgi - qishloq xo'jalik hayvonlari va inson salomatligi uchun o'ta xavfli zoonoz kasallik bo'lib, uning tabiiy o'choqlari uzoq yillar davomida saqlanib qolishi mumkin. Maqolada epizootik monitoringni tashkil etish, kasallikka moyil hududlarni aniqlash, epizootologik tahlil usullari hamda xavf omillarini baholash masalalari yoritilgan.

Shuningdek, kuydirgi kasalligining oldini olishda profilaktik emlash, veterinar-sanitariya qoidalariga rioya qilish, hayvonlar o'limi holatlarini o'z vaqtida tashxislash va utilizatsiya qilish, ozuqa va suv manbalarini muhofaza qilishning ahamiyati ko'rsatib o'tilgan. Maqolada veterinariya xizmati, mahalliy hokimiyat organlari va aholi o'rtasidagi hamkorlikni kuchaytirish epizootik barqarorlikni ta'minlashda muhim ekani ta'kidlanadi. Taqdim etilgan materiallar amaliyotchi veterinar shifokorlar, tadqiqotchilar va soha talabalari uchun foydali hisoblanadi.

Kalit so'zlari: kuydirgi kasalligi, epizootik holat, epizootik nazorat, profilaktika, veterinar-sanitariya tadbirlari, emlash, zoonoz kasalliklar, epizootologik monitoring, hayvonlar salomatligi, kasallikning oldini olish.

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MEASURES TO CONTROL AND PREVENT ANTHRAX EPIZOOTICS

Abstract: *This article analyzes comprehensive measures aimed at controlling the anthrax epidemic. Anthrax is an extremely dangerous zoonotic disease for farm animals and human health, and natural foci can persist for many years. The article discusses the issues of organizing epizootic monitoring, identifying disease-prone zones, methods of epizootic analysis and risk factor assessment.*

The importance of preventive vaccination, compliance with veterinary and sanitary standards, timely diagnosis and disposal of animal carcasses, as well as the protection of feed and water resources in the prevention of anthrax is also noted.

The article emphasizes the importance of strengthening collaboration between veterinary services, local authorities, and the public to ensure epizootic stability. The presented materials will be useful for practicing veterinarians, researchers, and students in this field.

Key words: anthrax, epizootic situation, epizootic control, prevention, veterinary and sanitary measures, vaccination, zoonotic diseases, epizootological monitoring, animal health, disease prevention.

Kirish. Kuydirgi kasalligi odam va hayvonlar uchun o'ta xavfli bo'lgan kasalliklar qatoriga kiradi, shu sababli ilm fan rivojlanishi bilan birgalikda veterinariya, tibbiyot hamda boshqa xizmatlar sohalari mutaxassilari va sohasidagi ko'pgina olimlar kuydirgi kasalligi muammosi bilan ishlab kelishmoqda va kasallikning paydo bo'lishi, tarqalishi, yuqumlilik darajasi, undan himoyalalanish usullari, kasallikni oldini olish bo'yicha juda ham ko'plab tadqiqotlar olib borishgan va turli xil ijobiy natijalarga ega bo'lishgan. Ushbu xulosalarga tayanadigan bo'lsak kasallikning barcha muammolari hal bo'lgan va amaliyotda bajarilib kelinmoqda va xuddi barcha muammolar hal bo'lgandek tuyuladi. Lekin bugungi kunda ham bu kasallik oldini olish va profilaktikasi bo'yicha yetarlicha dolzarb va haligacha ham chuqurroq tadqiqotlar olib borilishini talab etiladigan muammolar ham yo'q emas.

Kuydirgi kasalligining paydo bo'lish xavfi dunyoning hamma joyida bor. Kasallik bo'yicha epizootik holat dunyoning ko'p mamlakatlarida qayd etilib turiladi. Kasallikning majburiy o'lim holati paydo bo'lishi kasallik qo'zg'atuvchisining parazitoid yashash sharoitiga bog'liq bo'lganligi va kasallik epizootik tarqalgan davrida asosan hayvonlarning o'limi bilan tugashi kuydirgi kasalligining asosiy belgilaridan biri bo'lib hisoblanadi. Kasallikka hayvonlarning tabiiy sharoitlarda kasallik yuqtirib olishiga moyil bo'lishi hisoblanadi. Bu holat qanday yuzaga kelishi mumkin degan savolga quyidagicha ma'lumotlarni keltirib o'tish mumkin. Ya'ni kasallik qo'zg'atuvchisi spora shaklida tuproqda bir necha o'nlab yillar hattoki 100 yil va adabiyotlar ma'lumotlariga ko'ra undan ham ko'proq

vaqt davomida tuproqda saqlanib qolishi va turli xil dezinfektor moddalar va quyosh nuri ta'siriga ham chidamli shaklda turadi, qachonki qulay sharoit yuzaga kelib spora hayvon yoki odam organizmiga tushadigan bo'lsa kasallik paydo qilishi mumkin.

Kasallik qo'zg'atuvchisining organizmga tushib kasallik qo'zg'atishiga kuydirgi kasalligi mikrobining nafaqat miqdoriga yoki zararlanish joyiga balki hayvon turiga ham bog'liq ekanligi ko'rsatib o'tilgan. Shu asosda 19 turga mansub hayvonlar kasalanishi aniqlangan shundan yirik shoxli mollar eng ko'p zararlanishi ko'proq miqdorni tashkil etadi, shu bilan bir qatorda katta parazitoid sistemaga qo'y, echki, otlar, cho'chqalar, ko'pgina yovvoyi o'txo'r hayvonlar hisoblanib ularning ichida eng ko'pi kiyiklar, ohular, bizon, gippopotam hattoki fillar shu bilan bir qatorda yovvoyi kavsh qaytaruvchi va go'shtxo'r hayvonlar ham kasallanishi aniqlangan.

Bu holat esa endemik-hayvonlarning ta'siri natijasida tabiiy statsionar (tuproq) o'choqlarining paydo bo'lishiga sabab bo'ladi va doimiy ravishda tuproqning rekontiminatsiyasiga olib keladi. Bunday holatlar ko'pincha hayvonlarning erkin boqiladigan hududlarda ya'ni Afrika, Osiyo, Avstarliya davlatlarida, yovvoyi o'txo'r hayvonlarning kasallanishlari Afrika va AQShning janubiy qismida, bizonlar Kanadada, kiyiklar esa Rossiyaning g'arbiy qismida ko'proq kuzatiladi. Otsimonlarning va go'shtxo'rlarning zararlanishi holati sporadik holatda bo'lib boshi berk ko'chaga kirib qolish xarakteriga ega bo'lib asosan kamdan-kam holatlarda qayd etiladi va kuydirgi kasallagining epizootik yoki epidemik holatiga o'tmaydi.

Kuydirgi kasalligi eitologiyasi: kasallik qo'zg'atuvchisi **Bacillus anthracis** grammusbat spora hosil qiluvchi uzunligi 3-10 mkm va kengligi 1-1,5 mkm kattalikka ega bo'lgan tayoqchasimon bakteriya bo'lib kislorodli muhitga tushgandan keyin tashqi ta'sirlarga juda chidamli bo'lgan spora hosil qiluvchi bakteriya bo'lib hisoblanadi. Kislorodli sharoitda yuqori haroratga, quritishga va oddiy dezinfektor moddalarga chidamli bo'lib 80-100 va undan ham ko'proq vaqt mobaynida tashqi muhitda tuproqda saqlanib qoladi. Agarda tuproqda qulay sharoit bo'lsa ko'payish xususiyatga ham ega.

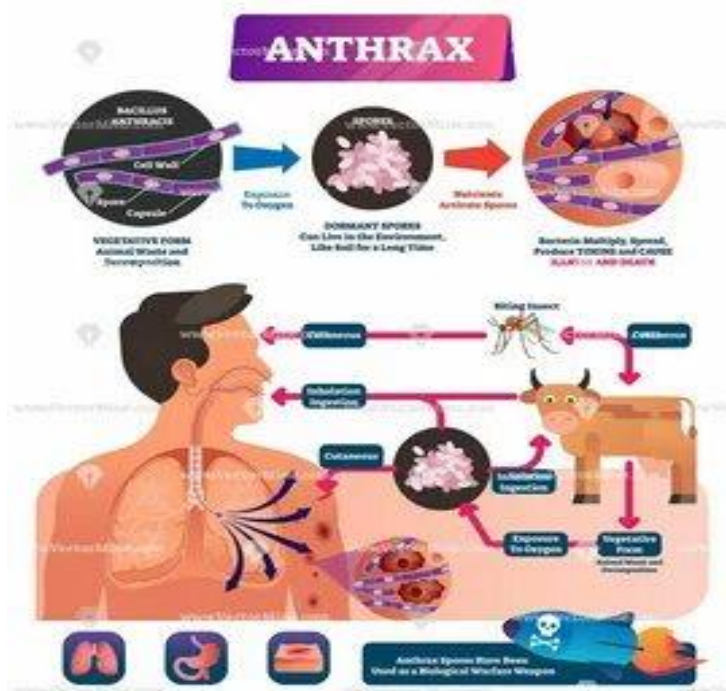


1-rasm. Kasallik qo'zg'atuvchisining mikroskop ostida ko'rinishi

1. Kasallikning asosiy rezervuari bo'lib kuydirgi kasalligi bilan kasallangan hayvonlarning chiqindilari tushgan tuproq va kasallikdan o'lgan hayvonlar ko'milgan joylar bo'lib hisoblanadi. Odamlar uchun esa kasal hayvon tashxis qilinmasdan so'yilib tarqatilgan go'sht, sut va boshqa qayta ishlangan go'sht mahsulotlari hisoblanadi.

2. Kasallikni o'rganish jarayonida birinchi navbatda quyidagilarga e'tibor qaratilishi lozim;

3. Kasallikning tuproqdan hayvonlarga yoki odamlarga yuqishi;
4. Kasallikning hayvonlar mahsulotlaridan odamlarga yuqishi;
5. Kasallik qo'zg'atuvchisining havo tomchi yo'llari orqali o'tishi;

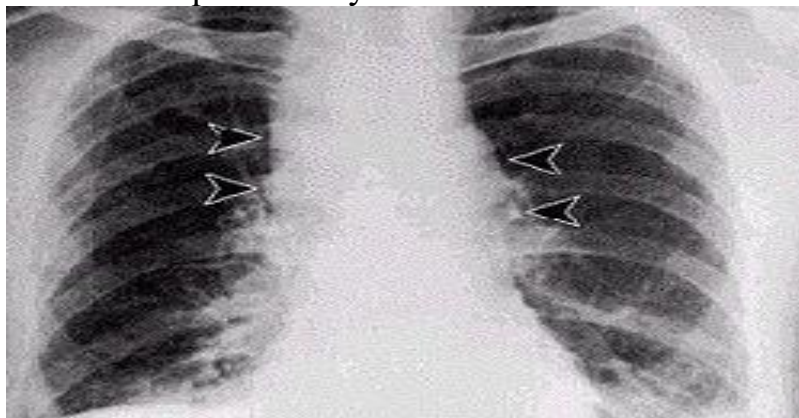


2-rasm. Kuydirgi kasalligining odamga va hayvonlarga o'tish yo'llari

Kasallikning qon soʻruvchi hashoratlar orqali transmissiv holatda hayvonlarga va odamlarga yuqishi mumkinligiga eʼtibor qaratilishi lozim.

Kuydirgi kasalligiga asosan yirik va mayda shoxli mollar, otlar, bugʻu va tuyalar yuqori sezuvchan boʻlsa, choʻchqalar va eshaklar kamroq sezuvchan, goʻshtxoʻr hayvonlar chidamliroq hisoblanadi. Parrandalar faqat eksperimental holatlardagina kasallanishi mumkin.

Kuydirgi kasalligi zoonoz kasallik boʻlib qoʻzgʻatuvchining hayvonlardan odamlarga yuqishi mumkin shuning uchun kasallikning oldini olish uchun epizootologik holatni nazorat qilish asosiy vaziflardan biri boʻlib hisoblanadi.



3-rasm. Odamda kuydirgining oʻpka shaklida kasallangan holatining rentgenologik koʻrinishi



4-rasm. Kuydirgining teri shakli bilan kasallanganda toʻqimalarning yiringli septik koʻrinishi

Kasallik manbai boʻlib asosan kasal hayvonlar va ulardan olingan mahsulotlar hisoblanadi. Zararlanish alimentar (ozuqa va suv) yoʻl bilan kamroq hollarda esa zararlangan teri, shilliq pardalar yoki transmissiv yoʻl bilan yaʼni qon soʻruvchi hashoratlar orqali yuqishi mumkin.

Kasallik yashinsimon tezlikda, oʻtkir, yarim oʻtkir va surunkali tarzlarda kechishi mumkin. Yashinsimon kechishida hayvon hech qanday klinik belgilersiz birdan oʻlib qolishi mumkin, oʻtkir kechganda esa (41-42°C) istima

holsizlanish, ishtahaning yo‘qolishi, tomoqda va to‘shda shishlar paydo bo‘lishi bilan kechishi va asosiy xarakterli belgisi bo‘lib esa tabiiy teshiklardan qon aralash suyuqlik oqishi bilan kechadi.

Diagnostikasi - kuydirgi kasalligiga tashxis qo‘yishda kompleks yondashiladi va bunda epizootik ma‘lumotlarga asoslangan holda klinik belgilar va laboratorik tekshirishlarga asoslanadi. Kuydirgi bilan kasallangan hayvonlarni so‘yish agarda hayvon nobud bo‘lgan bo‘lsa ularning gavdasini yorib ko‘rish qat‘iyan taqiqlanadi. Laboratorik tekshirish uchun o‘lgan hayvonning (cho‘chqadan boshqa hamma hayvonlardan) yerga tegib turgan qulog‘i kesilib yoki gavdaning shishgan qismidan biriktiruvchi to‘qimlari yoki (cho‘chqalarning) hiqildoq limfa tugunidan namuna olinib tekshirish uchun yuboriladi.

Kuydirgi kasalligi aniqlanganda karantin e‘lon qilinadi va quyidagi tadbirlar o‘tkaziladi:

mollarni so‘yish sexida kuydirgi kasalligi aniqlangan mol jasadi yoki kasal hayvon aniqlansa, mollarni qabul qilish to‘xtatiladi;

mol jasadlari texnik utilizatsiyaga yoki kuydirishga jo‘natiladi;

barcha olib kelingan hayvonlar klinik tekshiruvga va termometriyaga jalb qilinadi, cho‘chqalar kuydirgi kasalligi allergeni bilan allergik tekshiruvdan o‘tkaziladi;

yuqori tana haroratiga ega hayvonlar va allergenga musbat javob qilgan cho‘chqalar alohida qilinadi va davolanadi;

shu guruhdagi allergenga manfiy javob bergan, klinik jihatdan sog‘lom hayvon va cho‘chqalar zudlik bilan o‘ldiriladi;

boshqa olib kelingan mollar birlamchi ishlov berish sexiga o‘tkaziladi.

Har xil qo‘ralardan olib kelingan kuydirgi kasalligi aniqlangan hayvonlar to‘dasi aralashib ketgan bo‘lsa, dezinfeksiyalovchi eritmalar bilan namlanadi, go‘nglardan obdon tozalanadi va dezinfeksiyalovchi eritmalaridan biri bilan dezinfeksiya qilinadi.

Bakterioskopik tekshiruvda kuydirgi kasalligi aniqlansa, go‘sh t barcha organlari va terisi bilan, bakteriologik tekshiruv natijasini kutmasdan yo‘q qilish uchun (yoqib yuborishga) belgilangan veterinar-sanitar qoidalarga rioya qilgan holda jo‘natiladi.

Kuydirgi kasalligiga chalingan hayvonlardan olingan barcha mahsulotlar, shuningdek, kasallik aniqlangan hayvon mahsulotlari bilan aralashgan yoki ularning ta‘siriga uchragan boshqa xom ashyolar (masalan, oyoq, taloq, qon, ichki a‘zolar va boshqalar) to‘liq yoqish yo‘li bilan zararsizlantiriladi. Ushbu chora infeksiya manbaini butunlay bartaraf etish va kuydirgi sporalarining atrof-muhitga tarqalishining oldini olish maqsadida amalga oshiriladi.

Go‘sh t tayyorlash sexi poliga quruq xlorni tarkibida 25% faol xlor bo‘lgan aralashmani 1 kv.m maydonga 2 kg hisobidan sepib chiqiladi. Keyin 1 kv.m ni 5 litr suv bilan namlab chiqiladi.

Keyin xonaning devorlari (poldan 2 metr balandlikda) uskunalarning yuzalari 5% issiq (700Sdan kam bo‘lmagan) kalsiy sodasi eritmasi bilan yuvib chiqiladi va qoidaga binoan dezinfeksiya o‘tkaziladi.

Anjomlar (pichoq, bolta va boshqalar) 0,5% kalsiy sodasi eritmasida qaynatish yo'li bilan 90 daqiqa davomida dezinfeksiya qilinadi. Yoki avtoklavda 1,5 atmosfera bosimida 2 soat davomida zararsizlantiriladi. Uncha qimmat bo'lmagan anjomlar va boshqa metall jismlar kuydiriladi.

Maxsus kiyimlar avtoklavda yoki suvda 90 daqiqa davomida qaynatish orqali zararsizlantiriladi.

Sanitar qoidalar ustidan nazoratni davlat sanitar epidemiologik va osoyishtalik markazi organlari zimmasiga yuklatiladi.

Profilaktikasi. Birinchi novbatda huduning epizootik holatini e'tiborga olgan holda barcha qishloq xo'jalik va uy hayvonlarini rejali ravishda maxsus VNII VViM-55 shtammidan tayyorlangan vaksina bilan emlash agarda hududda kasallik chiqqan bo'lsa barcha sog'lom hayvonlarni majburiy ravishda revaksinatsiya qilish tavsiya etiladi. Enzoitik, sporadik va epizootik vaziyatlarni oldini olish uchun esa doimiy ravishda kasallik chiqishi xavfi bo'lgan hududlarni doimiy epizootik nazoratga olish talab etiladi.

Tabiiy sharoitlarda tuproq o'choqlarini doimiy nazoratga olish, sel suv toshqinlari, yer ko'chkilari, shamol eroziyasi yuz berganda esa o'sha hududlarda favqulodda vaziyatlarning oldini olish maqsadida rejali ravishda monitoring o'tkazib tuproq namunalarini mikrobiologik tekshiruvlardan o'tkazish zarur bo'ladi. Buning uchun esa albatta o'sha hududning o'ziga xos epizootik xaritasi va kartogrammasi bo'lishi zarur hisoblanadi. Bizning tadqiqotlarimiz ham ushbu holatdan kelib chiqqan holda ushbu muammolarning bartaraf etilishida muhim bo'g'in bo'lib hisoblanadi.

Kuydirgi kasalligining muammosi bilan shug'ullanishda qo'zg'atuvchining ekologiyasi to'g'risidagi bilimlarga ega bo'lish bilan birgalikda tashqi muhitning qo'zg'atuvchiga ta'sini, kasallik tarqalishining o'ziga xos epizootik xususiyatlarini bilish zarur bo'ladi. Kasallik muammosi bilan sobiq ittifoq davri respublikalarida Rossiyada (1963 y. E.N.Shlyaxov, 1968 y. A.V.Andronikov, 1971 y. K.S.Danilova, 1979 y. A.I.Zaviruxa), G'arbiy Sibirda (1971 y. S.I.Djupina va I.Y.Kogan), Buryatiyada (1971 y. I.L.Naymanov) shug'ullanishgan bo'lsa, O'zbekistonda (1975 y. D.A.Adilov, D.S.Sayfutdinov, P.I.Chechenin), 2003-2005 yillarda B.S.Sayitqulov, H.S.Salimov, G'.A.Mengliyev, A.S.Mengliyev, 2010-2020 yillarda B.T. Norqobilov, G'.A.Mengliyev, I.H.Salimov, H.S.Salimovlar kuydirgi kasalligi epizootologiyasining o'ziga xos xususiyatlari bilan shug'ullanishgan.

Xulosa: olib boriladigan maxsus profilaktik tadbirlar kasallikning qo'zg'atuvchisi bilan hayvonlarning zararlanishining oldi olinadi. bu esa o'z navbatida kuydirgi kasalligi qo'zg'atuvchisi sporasining tuproqda saqlanishi holatlarini doimiy nazoratga olish va ularni bartaraf etish chora – tadbirlarini ishlab chiqishdan iborat bo'lib statsionar nosog'lom o'choqlarning doimiy nazorati va epizootik o'choqning batafsil nazorati va tahlilini olib borish va ularning hududiy tarqalishi va o'ziga xos xususiyatlariga alosiy e'tibor qaratilishi lozim.

Agarda yuqoridagi keltirilgan holatlarni yanada chuqurroq mulohaza bilan o'rganib chiqadigan bo'lsak hali ham bu kasallikni bartaraf etish va oldini olish

bo'yicha yetarlicha muammolarni hal qilish uchun amaliyot bilan shug'ullanuvchi veterinar vrachlar, tibbiyot xodimlari va ilmiy tadqiqotchilar hamda boshqa epizootik va epidemik holatni nazorat qiluvchi organlar (FVV) oldida katta-katta amaliy va ilmiy-tadqiqot ishlarini amalga oshirishlari lozim bo'ladi.

Foydalanilgan adabiyotlar ro'yxati:

1. Адилов Д.А., Сайфутдинов Д.С., Чиченин П.И. Атлас стационарно неблагополучных по сибирской язве пунктов в Узбекской ССР. – Ташкент, «Узбекистан», 1979. – 412с.
2. Джупина С. И. Сравнительная эпизоотология сибирской язвы. // Ж. "Ветеринария», №9, 1999, с.13 – 17.
3. Jalilov K.J., Sayitkulov B.S. Zoonoz kasalliklar. –Toshkent, Ibn Sino nashriyoti, 1995. - S.223.
4. Ипатенко Н.Г. Антонюк В.П. Классификация неблагополучных по сибирской язве пунктов и иммунизация животных //«Биологические препараты против инфек. болезней ж-х». - М., 1981. - С. 71 – 73.
5. Менглиев Г.А., Салимов Х.С., Сайиткулов Б.С. Об очагах сибирской язвы. // Сборник 3-меж. науч. конф. – Самарканд, 2006. - С. 205.
6. Mengliyev G., Salimov X.S. O'zbekistonning shimoliy-g'arbiy viloyatlarida kuydirgi kasalligi o'choqlarining faolligi. //Зооветеринария. - Ташкент, 2009.- № 8.-9 б.
7. Mengliyev G. O'zbekistonning shimoliy viloyatlarida kuydirgi kasalligi o'choqlarining epizootologik tahlili. //Зооветеринария. – Ташкент, 2009. - № 7. – 14-15 betlar.
8. Yamtitina M.N., Makarov V.V. Anthrax Global Epizootology. Susceptible Animals. Veterinary Science Today. 2018;(4):4952. <https://doi.org/10.29326/2304-196X-2018-4-27-49-52>

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MAKTABGACHA TA'LIM TASHKILOTIDA INKLYUZIV TA'LIMMI TASHKIL ETISH YO'LLARI

Annotatsiya: Maqolada maktabgacha ta'lim tashkilotlarida inklyuziv ta'lim orqali bolalarga mehr va shu kabi axloqiy sifatlarni shakllantirish orqali ularda axloqiy sifatlarni tarbiyalashning ahamiyati, shakllari va metodlari haqida ma'lumotlar keltirilgan.

Kalit so'zlar: Bolalar, ta'lim, maktabgacha ta'lim tashkiloti, inklyuziv ta'lim, axloqiy, tushuncha, ekologik bilim, tabiatga muhabbat.

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WAYS TO ORGANIZE INCLUSIVE EDUCATION IN A PRESCHOOL EDUCATIONAL INSTITUTION

Annotation: The article provides information about the importance, forms, and methods of fostering moral qualities in children through inclusive education in preschool educational institutions, by cultivating compassion and other ethical traits.

Keywords: Children, education, preschool educational institution, inclusive education, moral, concept, ecological knowledge, love for nature.

Inklyuziv ta'lim – ta'lim muassasalari uchun barcha bolalarga ta'lim berish imkoniyatidir. Ushbu ta'lim insonning asosiy huquqi sifatida tushunishga asoslanadi. Inklyuziya keng ma'noda ham, tor ma'noda ham qo'llaniladi. Keng ma'noda - u urush qurboni bo'lgan alohida ehtiyojli bolalar, qochoq bo'lgan bolalar, kam ta'minlangan oilalarning farzandlari, ijtimoiy zaif oilalarning bolalari, iste'dodli bolalar, sog'ligida muammolari bo'lgan bolalar va boshqalarni o'z ichiga oldi.

Inklyuziv ta'lim g'oyalari ijtimoiy - madaniy nazariyalarga asoslanadi. Psixolog L.Vigotskiy (1986-1934) inklyuziv ta'lim g'oyasining asoschisi bo'lib, uning ijtimoiy konstruktivizm nazariyasi orqali bolalar ijtimoiy muhitda eng samarali bilim oladilar. L.Vigotskiy oliy aqliy funksiyalarning rivojlanishi ijtimoiy hamkorlikdan boshlanadi va keyin shaxsiy bo'ladi deb aytib o'tgan.

Shunday qilib, bu ijtimoiy hamkorlik har doim rivojlanish va o'rganishning asosiy usuli hisoblanadi. Shuningdek, u ta'lim rivojlanishdan oldin ekanligiga ishongan. Kattalar bolaning "bevosita rivojlanish zonasida" bo'lgan ko'nikma yoki bilimlariga e'tibor berib, o'rganishni rag'batlantirishlari mumkin. L.Vigotskiy "bunday rivojlanish zonasi"ni bolaning biladigan yoki qila oladigan va qobiliyatli odam yordamida nima qilishlari yoki tushunishlari mumkin bo'lgan maydon yoki makon sifatida aniqladi.

L.Vigotskiyning ijtimoiy - madaniy rivojlanish nazariyasi pedagogning ro'lini aniq belgilaydi. Biz farzandlarimizni yaxshi bilishimiz va ularning "yaqin rivojlanish markazi" doirasida o'quv faoliyatini aniqlash uchun ular bilan faol muloqotda bo'lishimiz kerak. Agar bolalar birinchi navbatda ijtimoiy hamkorlik orqali o'rgansalar, biz pedagoglar bolaning boshqa bolalar va kattalar bilan o'zaro aloqada bo'lgan vaqlini maksimallashtirishimiz kerak. Maktabgacha yoshdagi bolalarning shovqinli (lekin baland bo'lmagan), band (lekin tartibsiz bo'lmagan) guruhi - bu normal o'quv muhitidir.

Ko'pgina mamlakatlarda inklyuziv ta'lim amaliyoti bu nazariyaning to'g'riligini ko'rsatib berdi. Tadqiqotlarga ko'ra, alohida ehtiyojli bolalar o'z tengdoshlari bilan birga o'qisalar. o'rganishda, ijtimoiy muloqotda ancha yaxshi natijalami ko'rsatishga moyildirlar.

Barcha bolalar inklyuziv ta'lim amaliyotidan yaxshi foyda oladilar. Odatda, alohida ehtiyojli bolalar rivojlanayotgan tengdosh bolalar bilan bir guruhda bo'lishi ularga taqlid qilishga, ular bilan muloqot qilishga, ijtimoiy ko'nikmalarini rivojlantirishga harakat qiladi. Rivojlanayotgan bolalar alohida ehtiyojlari bor odamlar duch keladigan muammolarni tushunib boradilar. Ular boshqalarning ehtiyojlariga sezgir bo'lib, farqlarni yaxshiroq anglaydilar. Ular barcha odamlar muhim muammolarni bartaraf eta olishlariga va muvaffaqiyatga erishishlari mumkinligini bilib oladilar.

Pedagoglarga guruhda alohida ehtiyojli bolalar bo'lishi ham manfaatlidir, bunda ular o'quv uslublaridagi farqlarni kuzalishda malakaga ega bo'lishlari mumkin. Ular, shuningdek, bolalarning individual kuchli tomonlarini baholashda o'zlarga ko'proq ishonch orttiradilar va shu bilan birga qo'llab-quvvatlash kerak bo'lgan tomonlarini aniqlaydilar. Bu barcha bolalarni o'qitishda tarbiyachilarga bolaning individual kuchli tomonini va alohida ehtiyojlarini aniqlashga va shu asosida ta'lim ulubini yaxshilashga imkon beradi. Inklyutiv ta'limning mavjudligi bolalar bir-biridan ko'p jihatdan farq qilishini va bu farqlar to'siq emas, balki qimmatli manba ekanligini tan olish demakdir. Bolalarning turli ta'lim ehtiyojlari va imkoniyatlari va ularning turli rivojlanish sur'atlarini o'quv faoliyati va ta'lim strategiyasini individuallashtirish va differensiallashtirish yo'li bilan qondirish mumkin.

Inklyuziv maktabgacha ta'lim tashkilotlarining o'ziga xos xususiyatlari:

- alohida ehtiyojga muhtoj bolalarning umumiy ta'limi bilan muntazam guruhlarda pedagoglar bilan birgalikda mutaxassislar jamoasi shug'ullanadilar;

- alohida ehtiyojga muhtoj bolalarning qanchasini bir guruhga muvaffaqiyatli kiritish mumkinligini aniqlab olish zarur. Odatda, bu miqdor har bir bolaning xususiyatlari turiga va pedagogning o'z maktabgacha ta'lim tashkilotidan oladigan yordamiga bog'liq. Masalan, boshqa mutaxassislar yordami bilan pedagog faqat bitta og'ir kasallikka chalingan bolani yoki yengil tashxis qo'yilgan bir necha bolani o'z guruhiga olishi mumkin. Guruhdagi bolalar umumiy sonining 5-10 % dan ko'p bo'lmagan shtati bo'yicha alohida ehtiyojga muhtoj bolalarni ham o'z ichiga olish amaliyoti mavjud. Agar guruhda 20 nafar bola bo'lsa, alohida ehtiyojga muhtoj 1-2 nafar bolani qabul qilish;

- farzandlarining ta'lim-tarbiyasi va rivojlanishiga doir qaror qabul qilishda ota - onalar va boshqa oila a'zolari foal ishtirok etishi;

- barcha pedogoglar (guruh tarbiyachisi, maktabgacha ta'lim psixologi ya defektologi, musiqa rahbari, jismoniy tarbiya yo'riqchisi) jamoa bo'lib ishlaydi va ularning sa'y-harakatlarini muvofiqlashtiradi. Qarorlar bir-biri bilan samarali hamkorlik qiladigan jamoa a'zolari tomonidan qabul qilinadi;

- strategiyalar va ta'lim berish butun bolalarning rivojlanishini ta'minlaydi va har bir alohida bolaning maxsus rivojlanish ehtiyojlarini hisobga oladi;

- maxsus ehtiyojli bolalar bilan ishlash individual bolaning rivojlanish xaritasi, bolalarning kuchli tomoni va ehtiyojlarini inobatga olgan holda tuzilgan;

- dasturlarning samaradorligi muntazam baholanadi; barcha manfaatdor tomonlar jalb etiladi (oilalar, a'zolari, pedagoglar, boshqa mutaxassislar);

barcha pedagoglar maxsus ehtiyojli bolalarni o'qitish va rivojlanish xususiyatlari haqida tushunchaga ega bo'lishlari, treninglar orqali maxsus tayyorgarlikdan o'tib, malakalarini oshirish, maxsus adabiyotlarni o'rganishlari kerak.

FOYDALANILGAN ADABIYOTLAR RO'YXATI:

1. Tursunova, Rayxonoybibi Ravshan. "MAKTABGACHA TA'LIM TASHKILOTIDA BOLALARNI TABIAT BILAN TANISHTIRISH ORQALI TARBIYALASH." *Analysis of world scientific views International Scientific Journal* 1.6 (2023): 48-50.

2. Vinogradova N.F., Kulikova T.A. Bolalar, kattalar va atrofdagi dunyo, M.: Ta'lim, 1993 yil.

3. Tursunova, Rayxonoybibi Ravshan. "MAKTABGACHA TA'LIM TASHKILOTIDA BOLALARNI TABIAT BILAN TANISHTIRISH ORQALI TARBIYALASH." *Analysis of world scientific views International Scientific Journal* 1.6 (2023): 40-42.

4. Bolalar bog'chasida bolalarni tabiat bilan tanishtirish usullari. ed. P. G. Samorukova. - M.: Ma'rifat, 1981 yil

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CHALLENGES IN CLINICAL LABORATORY IMPLEMENTATION OF PCR: A COMPREHENSIVE ANALYSIS

Abstract: *Polymerase Chain Reaction (PCR) is a cornerstone molecular diagnostic technique in clinical laboratories due to its high sensitivity and specificity. However, implementing PCR in routine laboratory practice faces several challenges, including contamination risk, sample quality and storage issues, reagent and equipment variability, and human error. This article reviews the major challenges encountered in clinical PCR applications and discusses strategies to minimize errors to ensure accurate and reliable diagnostic outcomes.*

Keywords: *PCR, clinical laboratory, contamination, diagnostic quality, molecular diagnostics, laboratory errors*

Introduction

Polymerase Chain Reaction (PCR) has become one of the most transformative molecular techniques in modern clinical diagnostics. Its ability to amplify minute quantities of nucleic acids allows clinicians to detect pathogens, genetic mutations, and other clinically relevant sequences with unparalleled sensitivity and specificity. PCR has proven essential in diagnosing infectious diseases, genetic disorders, oncologic markers, and emerging pathogens, such as SARS-CoV-2. Its rapid turnaround time compared to traditional culture methods makes PCR indispensable in acute care and epidemic monitoring.

Despite its widespread adoption, PCR implementation in clinical laboratories faces numerous challenges. The high sensitivity that makes PCR valuable also increases the risk of contamination, leading to false-positive results. Other factors, including sample quality, reagent variability, equipment performance, and human error, may compromise diagnostic accuracy. For example, improper sample collection, prolonged storage, or transport outside the recommended temperature range can degrade nucleic acids, reducing the likelihood of accurate amplification. Furthermore, laboratory personnel require extensive training to correctly handle PCR reactions, manage contamination risks, and interpret results reliably.

This article aims to provide a comprehensive review of the main challenges in clinical PCR implementation. It examines technical, operational, and human-related factors and presents strategies for minimizing errors to ensure reliable and reproducible diagnostic outcomes. Understanding these challenges is crucial for laboratories seeking to maintain high-quality standards in molecular diagnostics.

Materials and Methods

This review is based on a systematic evaluation of peer-reviewed publications, clinical laboratory guidelines, and quality control standards relating to PCR diagnostics. Sources were identified through PubMed, ScienceDirect, StatPearls, and PMC databases using keywords such as “PCR diagnostics,” “clinical laboratory errors,” “PCR contamination,” and “quality control in PCR.”

Key data points extracted from the literature included:

- Pre-analytical errors (sample collection, handling, and storage)
- Analytical errors (PCR amplification, primer specificity, thermal cycling consistency)
- Post-analytical errors (result interpretation, reporting accuracy)
- Laboratory quality assurance and standard operating procedures

The analysis also incorporated case reports and observational studies documenting the impact of these challenges on diagnostic reliability. The review emphasizes the importance of systematic approaches to contamination control, staff training, equipment maintenance, and reagent validation.

Results

Analysis of the literature and laboratory reports highlights several primary challenges associated with clinical PCR implementation:

1. Sample Collection and Handling

Improper sample collection remains a leading source of error. Biological specimens may contain inhibitors such as hemoglobin or heparin, which interfere with PCR amplification. Inadequate storage conditions or delayed processing can lead to nucleic acid degradation. For instance, viral RNA is particularly labile and may degrade within hours if not stored at recommended temperatures, reducing assay sensitivity and potentially yielding false-negative results.

2. Contamination Leading to False Positives

The high amplification capacity of PCR makes it extremely susceptible to contamination. Trace amounts of DNA or RNA from previous experiments, aerosols, or surfaces can produce false-positive results. Common sources of contamination include pipettes, reagents, workbenches, and even laboratory personnel. This challenge is especially critical in high-throughput laboratories where multiple PCR reactions are processed simultaneously.

3. Primer and Probe Design Issues

Suboptimal primer design can reduce PCR specificity. Non-specific binding, secondary structures, or primer-dimer formation may interfere with amplification efficiency. These issues can result in ambiguous or inaccurate results, particularly when testing for low-abundance targets. Regular validation of primers and probes is essential to ensure specificity and reliability.

4. Reagents and Equipment Variability

Differences in reagent quality, thermal cycler calibration, and batch-to-batch variability can impact PCR efficiency and reproducibility. For example, outdated or improperly stored reagents may yield inconsistent amplification. Similarly, thermal

cyclers with uneven heating or malfunctioning blocks can produce variable results across wells or runs, compromising diagnostic confidence.

5. Human and Operational Factors

Laboratory personnel play a critical role in ensuring accurate PCR results. Errors in pipetting, failure to follow aseptic technique, or deviations from standard operating procedures can lead to false positives, false negatives, or inconsistent results. Continuous training, competency assessments, and adherence to laboratory protocols are vital to minimize human-induced errors.

Discussion

PCR diagnostics provide extraordinary sensitivity and specificity but require meticulous laboratory practices to maintain reliability. Contamination control remains the most significant concern in clinical laboratories. Even a single molecule of contaminating nucleic acid can produce a misleading result. Effective strategies include the physical separation of pre- and post-amplification areas, unidirectional workflow, and routine decontamination of equipment and surfaces.

Quality assurance and validation are crucial for both reagents and instruments. Regular calibration of thermal cyclers, validation of new reagent lots, and participation in external quality assessment programs can significantly reduce analytical variability. Primer and probe optimization also contributes to assay specificity, reducing the likelihood of non-specific amplification.

Human factors must not be underestimated. Continuous training in molecular techniques, awareness of contamination risks, and strict adherence to SOPs are essential components of a robust PCR program. Some laboratories are adopting automated PCR platforms and closed-system assays to minimize manual handling, thereby reducing human error and contamination risk.

By addressing these technical, operational, and human-related factors collectively, laboratories can achieve highly reliable PCR results. Reliable PCR diagnostics enhance clinical decision-making, allow timely treatment interventions, and contribute to improved patient outcomes.

Conclusion

PCR remains an indispensable tool in modern clinical diagnostics, offering unmatched sensitivity and rapid results. However, its implementation in clinical laboratories is challenged by contamination risks, sample handling issues, reagent and equipment variability, and human factors.

Mitigating these challenges requires a multifaceted approach, including:

- Strict laboratory design with separated work zones
- Comprehensive quality assurance programs for reagents and instruments
- Regular staff training and competency assessments
- Optimized assay design and validation
- Adoption of automated systems where possible

By applying these measures, clinical laboratories can maximize the accuracy, reproducibility, and clinical utility of PCR diagnostics, ultimately improving patient care and supporting public health initiatives.

References

1. Yang S, Rothman RE. PCR-based diagnostics for infectious diseases: Uses, limitations, and future applications in acute-care settings. *Lancet Infect Dis.* 2004;4(6):337–348. doi:10.1016/S1473-3099(04)01044-8. [PMC Link](#)
2. Sheils OM. Quality-control issues for PCR-based assays in the molecular laboratory. *J Mol Diagn.* 2003;5(2):59–63. [ScienceDirect Link](#)
3. Standardization and quality control of PCR analyses. *SciSpace Review.* Discusses contamination, false positives, and importance of QA. [PDF Link](#)
4. Clinical Laboratory Best Practices. Preventing false-positive and false-negative PCR results. *ClinicalLab.com.* [Link](#)
5. StatPearls. Biochemistry, Polymerase Chain Reaction | Treatment & Management | Point of Care. [StatPearls Link](#)
6. Bustin SA, Nolan T. Pitfalls of quantitative real-time reverse-transcription polymerase chain reaction. *J Biomol Tech.* 2004;15(3):155–166. doi:10.7171/jbt.15-3-001.
7. Dieffenbach CW, Dveksler GS. *PCR Primer: A Laboratory Manual.* 2nd edition. Cold Spring Harbor Laboratory Press; 2003.

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KICHIK KORXONA UCHUN LOKAL TARMOQNI LOYIHALASH VA AXBOROT XAVFSIZLIGINI TA'MINLASHNING AMALIY YECHIMLARI

Annotatsiya. Ushbu maqolada kichik korxona sharoitida lokal tarmoqni amaliy loyihalash va axborot xavfsizligini tizimli ta'minlash masalalari yoritiladi. Asosiy e'tibor tarmoqni biznes ehtiyojlariga mos rejalash, segmentatsiya orqali xavflarni kamaytirish, ishonchli ulanish va xizmatlarni barqaror ishlatish hamda boshqaruv, nazorat, zaxiralash kabi xavfsizlik mexanizmlarini joriy etishga qaratiladi. Adabiyotlar sharhida tarmoq arxitekturasini bo'yicha klassik yondashuvlar, tarmoq xavfsizligi tamoyillari, kichik biznes uchun riskka asoslangan boshqaruv, amaliy nazoratlar majmui hamda axborot xavfsizligi boshqaruv tizimi talablarining o'zaro bog'liqligi tahlil qilinadi.

Kalit so'zlar: lokosin tarmoq, kichik korxona, tarmoq loyihalash, VLAN segmentatsiya, Wi-Fi xavfsizligi, firewall, kirishni boshqarish, zaxiralash, monitoring, riskni boshqarish.

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PRACTICAL SOLUTIONS FOR DESIGNING A LOCAL NETWORK AND ENSURING INFORMATION SECURITY FOR A SMALL ENTERPRISE

Abstract. This article discusses practical solutions for designing a small business local area network and ensuring information security through a structured approach. The focus is on aligning network architecture with business needs, reducing risks via segmentation, ensuring reliable connectivity and services, and implementing both governance and technical security controls.

Keywords: small business network, LAN design, VLAN segmentation, wireless security, firewall, access management, backup, logging, monitoring, risk management.

Kirish

Kichik korxonada lokal tarmoq ko'pincha biznesning yuragi bo'lib qoladi: hisob va savdo tizimlari, hujjatlar aylanishi, pochta, mijozlar bazasi, kassalar, printerlar, videokuzatuv, bulut xizmatlari va masofadan ishlash aynan tarmoq orqali yashaydi. Shunga qaramay, amaliyotda tarmoq ko'pincha shoshilinch ehtiyoj bilan

yig'iladi: bir nechta yo'riqnoma, arzon kommutator, paroli hammaga ma'lum Wi-Fi va tayinlanmagan mas'uliyat. Bunday holat birinchi oylar ishlayotgandek ko'rinadi, keyin esa uzilishlar, tezlik muammosi, ichki resurslarga ruxsatsiz kirish, ma'lumot yo'qolishi, virus va fishingdan zarar, audit va tekshiruvlarda tushunmovchiliklar paydo bo'ladi. Tarmoqni to'g'ri loyihalash esa faqat sim ulash emas, u biznes jarayonlarini tushunish, tarmoq qatlamlari bo'yicha aniq arxitektura tuzish, kirishni boshqarish, xavfsizlik siyosatlarini belgilash, zaxira va monitoringni yo'lga qo'yish degani.

Zamonaviy yondashuv tarmoq xavfsizligini alohida texnik vazifa sifatida emas, boshqariladigan risklar majmui sifatida ko'radi. Bunda korxona o'z aktivlarini aniqlaydi, tahdid va zaifliklarni baholaydi, ustuvor himoya choralari tanlaydi va doimiy takomillashtiradi. NIST kiberxavfsizlik doirasi boshqaruv, aniqlash, himoya, aniqlash, javob, tiklash natijalarini bir tizimga jamlab, kichik tashkilotlarga ham moslashuvchan yo'l xaritasi beradi [3].

Adabiyotlar sharhi

Lokal tarmoqni loyihalash masalasi avvalo tarmoqning ichki ishlash tamoyillariga borib taqaladi. Tarmoq qatlamlari, uzatish muhiti, marshrutlash va kommutatsiya, kechikish va yuklama, ishonchlilik va xizmat sifati kabi tushunchalar tarmoq arxitekturasini ongli qurish uchun asos bo'ladi [1]. Klassik yondashuv shuni ko'rsatadiki, tarmoqdagi muammolarning katta qismi fizik darajada emas, noto'g'ri segmentatsiya, adreslash va boshqaruv qarorlaridan kelib chiqadi. Demak, kichik korxona ham tarmoqni shunchaki ulab qo'yish emas, rejalashga tayanib qurishi kerak.

Tarmoq xavfsizligi bo'yicha fundamental manbalarda himoya modeli odatda bir nechta qatlamga bo'linadi: perimetr nazorati, ichki segmentlar, host darajasi, ilova darajasi va boshqaruv darajasi [2]. Bu yondashuv kichik korxona sharoitida ham muhim, chunki faqat bitta firewall yoki faqat antivirus bilan cheklanib bo'lmaydi. Xavfsizlikning amaliy qiymati shundaki, hujumchi bitta eshikdan kirmasa, u darhol ma'lumotgacha yetib bormaydi, yo'llar torayadi, izlar qoladi va javob berish osonlashadi.

Riskka asoslangan boshqaruv bo'yicha NIST doirasi tashkilotning maqsadlarini hisobga olgan holda natijaviy ko'rsatkichlar orqali xavfsizlikni yo'lga qo'yishni tavsiya qiladi va aynan kichik tashkilotlar uchun ham mos keladigan moslashuvchan struktura beradi [3]. Shu bilan uyg'un ravishda NIST kichik biznes qo'llanmasi minimal siyosatlar, aktivlarni ro'yxatga olish, zaxira, yangilash, ruxsatlar, tashqi xizmatlar va xodimlar xabardorligi kabi amaliy qadamlarni ustuvor deb ko'rsatadi [4]. Bu ikki manba kichik korxona uchun texnik qarorlar bilan birga tashkiliy choralarni ham bir paketga aylantirish kerakligini isbotlaydi.

Tadqiqot metodologiyasi va empirik tahlil

Kichik korxona uchun tarmoq loyihasi odatda uch savoldan boshlanadi: kim ishlaydi, nima ishlaydi, qachon ishlaydi. Kim deganda foydalanuvchilar va qurilmalar nazarda tutiladi: xodim kompyuteri, noutbuk, telefon, printer, kamera, ombor skaneri, kassalar, server yoki NAS, mehmon qurilmalari. Nima deganda xizmatlar nazarda tutiladi: internet, ichki fayl almashish, buxgalteriya tizimi, CRM,

videokuzatuv, IP telefon, bulut ilovalari, masofadan ulanish. Qachon deganda ish rejimi, yuklama cho‘qqilari, uzilishning biznesga ta’siri va xizmat ko‘rsatish vaqtlarining imkoniyati nazarda tutiladi. NIST kichik biznes tavsiyalarida aktivlarni aniqlash va riskni tushunish birinchi qadam sifatida keltirilishi bejiz emas [4]. Aynan shu bosqichda xavfsizlik talablari ham chiziladi: kimga qaysi resurs kerak, nimalar umumiy, nimalar ajratilgan bo‘lishi shart, qaysi ma’lumot eng qimmat, qaysi xizmat to‘xtasa biznes to‘xtaydi.

Natijalar

Kichik ofis uchun eng barqaror topologiya markazlashgan yulduz prinsipiga tayanadi: barcha ish joylari markaziy kommutatorga keladi, u yerda marshrutlash va xavfsizlik perimetr qurilmasi bilan bog‘lanadi. Bu yondashuv tarmoqni boshqarishni osonlashtiradi, nosozlikni tez topishga yordam beradi va kengayishga qulay [1]. Kabellashda keyingi yillarda talab oshishini hisobga olib, ish joyiga kamida ikki port rejalash amaliy jihatdan to‘g‘ri, chunki bir port kompyuterga, ikkinchisi IP telefon, printer yoki qo‘shimcha qurilmaga ketishi mumkin. Wi-Fi esa kabelning o‘rnini to‘liq bosmaydi, u mobil ish uslubi va mehmonlar uchun qulay qatlam bo‘lib xizmat qiladi. Wi-Fi ni boshqariladigan nuqtalar orqali, qamrov zonasi va kanal rejasini hisobga olib qurish uzilishlarni kamaytiradi, ayniqsa ko‘p kvartirali binolarda interferensiya muammo bo‘lishi mumkin.

Uzluksizlik uchun kichik korxonada ham minimal energiya himoyasi zarur: markaziy tarmoq tugunlari uchun uzluksiz quvvat manbai, to‘g‘ri yerga ulash, ortiqcha kuchlanishdan himoya. Bu xavfsizlikning bir qismi, chunki elektr muammolari ko‘pincha konfiguratsiya buzilishiga, ma’lumot yo‘qolishiga va tiklash vaqtining cho‘zilishiga olib keladi. ISO talablari doirasida uzluksizlik va resurslarni ta’minlash boshqaruvning ajralmas bo‘lagi sifatida qaraladi [6].

Kichik korxona tarmog‘ining eng katta amaliy yutug‘i segmentatsiya orqali keladi. Segmentatsiya deganda tarmoqni mantiqiy zonalariga bo‘lish tushuniladi: xodimlar zonasi, server yoki umumiy resurslar zonasi, videokuzatuv zonasi, mehmon Wi-Fi zonasi, boshqaruv zonasi. Buni VLAN asosida amalga oshirish odatda eng qulay yo‘l, chunki bir xil kabel infratuzilmasi ustida alohida mantiqiy tarmoqlar yaratiladi va ular orasidagi trafik nazorat qilinadi [1]. Segmentatsiya sababli bir zonada muammo chiqsa, u darhol hamma joyga tarqalmaydi. Masalan, mehmon Wi-Fi dan faqat internetga chiqishga ruxsat beriladi, ichki fayl server yoki printerlarga yo‘l yopiladi. Videokameralar zonasi esa faqat yozuv qurilmasi yoki monitoring serveri bilan gaplashadi, xodim kompyuterlariga bevosita ko‘rish huquqi cheklanadi. Bu qatlamli himoyaga mos keladi va tarmoq xavfsizligi bo‘yicha tavsiyalarda ichki tarmoqlarni ajratish amaliyoti doimiy urg‘u bilan keltiriladi [2].

Adreslash rejasini boshidan to‘g‘ri tuzish keyinchalik tarmoqni boshqarishni yengillashtiradi. Har bir VLAN uchun alohida subnet ajratish, statik beriladigan qurilmalar ro‘yxatini yuritish, DHCP orqali dinamik manzillarni nazorat qilish, DNS ni tartibli ishlatish kichik tarmoqda ham intizom beradi. CIS Controls doirasida aktivlar hisobini yuritish va xavfsiz konfiguratsiya ustuvor vazifa bo‘lgani uchun adreslash va konfiguratsiya hujjati oddiy ko‘rinishda bo‘lsa ham, muntazam

yangilanib borishi kerak [5]. Natijada hodisa yuz bersa, kim qayerda ulanganini, qaysi qurilma qaysi zonada ekanini tez aniqlash mumkin bo'ladi.

Kichik korxona uchun eng ko'p xato qilinadigan joy internet perimetri. Birinchi qoida shunday: ichki tarmoqqa bevosita kirish portlarini internetga ochib qo'yish kerak emas. Masofaviy ish zarur bo'lsa, VPN orqali, kuchli autentifikatsiya bilan va ruxsatlar minimal prinsipi bo'yicha yo'lga qo'yiladi [2]. NIST doirasidagi himoya natijalari va NIST kichik biznes tavsiyalarida ham masofaviy kirish, hisoblar, yangilash, zaxira kabi bazaviy yo'nalishlar ustuvor hisoblanadi [3], [4]. Amaliy jihatdan VPN foydalanuvchisi ham segmentatsiya qoidalariga bo'ysunishi kerak: u hamma narsaga emas, o'z ishiga kerak resurslargagina kiradi.

Xulosa va munozara

Kichik korxona uchun lokal tarmoqni loyihalash va axborot xavfsizligini ta'minlashning eng to'g'ri yo'li texnik va tashkiliy choralarni bir butun ko'rishdan boshlanadi. Tarmoq arxitekturasini qatlamlar mantiqiga tayanib qurilganda, segmentatsiya orqali ichki risklar boshqarilganda, perimetr va masofaviy kirish tartibli yo'lga qo'yilganda, loglar va zaxira tizimi ishlaganda, korxona nafaqat tez ishlaydigan, balki tiklanadigan infratuzilmaga ega bo'ladi. Adabiyotlar shuni ko'rsatadiki, tarmoqning barqaror ishlashi uchun rejalash va qatlamli arxitektura muhim, xavfsizlik uchun esa ko'p qatlamli himoya, minimal ruxsat va nazorat mexanizmlari zarur. Riskka asoslangan boshqaruv yondashuvi kichik korxonaga xavfsizlikni bosqichma bosqich yo'lga qo'yish imkonini beradi, kichik biznes bo'yicha amaliy tavsiyalar esa ortiqcha murakkabliksiz minimal paketni beradi.

Adabiyotlar ro'yxati

1. Tanenbaum A. S., Feamster N., Wetherall D. J. Computer Networks. 6th edition. Harlow: Pearson, 2021. 960 p.
2. Stallings W. Network Security Essentials: Applications and Standards. 6th edition. Boston: Pearson, 2021. 480 p.
3. National Institute of Standards and Technology. The NIST Cybersecurity Framework CSF 2.0. NIST CSWP 29. Gaithersburg: NIST, 2024.
4. Paulsen C., Toth P. Small Business Information Security: The Fundamentals. NISTIR 7621 Revision 1. Gaithersburg: NIST, 2016.
5. Center for Internet Security. CIS Critical Security Controls Version 8.1. East Greenbush: CIS, 2024.
6. ISO, IEC. ISO IEC 27001:2022 Information security management systems Requirements. Geneva: ISO, 2022.

MANAGING STUDENTS' INDEPENDENT WORK IN THE EDUCATIONAL ENVIRONMENT

Abstract: *In article, independent student work was examined as a necessary condition for implementing competency-based education, designed to serve as a means of pedagogical management of students' cognitive activity. After all, the primary goal of university education is to teach students to independently solve professional problems and to awaken their interest in their future profession. Therefore, independent work as a form of educational process should be an integral and important part of the development of a competitive specialist.*

Keywords: *Independent work of students, organization and management of independent work, electronic educational and methodological complex of the discipline, scoring and rating system.*

Introduction

Students' learning activities increasingly involve independent work using specialized literature, tests, and reference materials. Therefore, teachers often have to act as coordinators of learning activities. In these changing conditions, the role of the student in the teaching process is significantly altered. With a wide range of available teaching aids and knowledge sources at their disposal, students become increasingly active participants in the learning process.

Student independent work is a teacher-planned learning activity that promotes student development and professional self-determination. Student independent work is completed without direct contact with the teacher, but it is a process indirectly managed by the teacher: through educational and methodological documentation, teaching and assessment tools, and specialized educational materials.

Methods

The primary level of organizing and managing independent work is management within a specific academic discipline, which aims to develop students' intellectual skills and personal qualities, as well as elements of intellectual culture.

The principle of individualization in education in general and in the independent work management system in particular includes:

- ✓ moving on to new material only after thoroughly mastering the previous material;
- ✓ individualized pace of acquisition of new knowledge and skills;

✓ processing of material, use of preferred written sources of knowledge, engaging more advanced students as consultants, using lectures to motivate independent cognitive activity, and equipping students with a methodology for learning.

Analysis and results

How to carry out the process of independent learning, its development, the level of independent learning activities on the basis of acquired knowledge can be determined by the following criteria:

- ❖ goal-oriented, motivated independent learning;
- ❖ skills for independent thinking;
- ❖ skills to organize independent learning activities.

In the process of independent study, students refer to additional literature, review the topics covered. Many students work on the text of homework, use popular science and periodicals in the preparation of lectures and abstracts.

It is necessary to manage students' independent work based on methodological instructions and teaching materials. The educational and teaching materials with which students work can be roughly divided into two parts:

Academic texts, teaching materials (textbooks, manuals, problem sets, etc.)

Methodological instructions for working with the material. These materials, especially methodological instructions, serve as a means of directly managing students' work in real-life teaching (i.e., managing in the absence of the teacher). They provide a general outline of the teacher's experience (their recommendations and instructions), which are then conveyed to the student. Such instructions are developed separately for each academic unit.

Didactic materials and teaching aids are of great importance to students in a lecture course. They can take the form of outlines, where each topic of the lecture course is presented in the form of logically separated semantic sections, followed by several approximate questions or cognitive tasks. Such aids themselves teach students and help them in future independently identify the main semantic sections of the lecture, which is necessary for a better understanding of the material. It's useful to distribute didactic materials to students in advance so that they can serve as a reference both during the lecture and during their homework preparation.

Students' desire to study specific information contained in the didactic materials moderates and stimulates their independent work. This guides their homework preparation for the next lecture, facilitates a deeper understanding of the lecture material, and promotes the development of book-reading skills. Students themselves choose which literature to use in their preparation.

All this creates conditions for the self-organization of students' cognitive activity, which becomes goal-oriented and occurs without the direct involvement of the instructor (although the instructor is, of course, invisibly present and guides the students' work through the program laid out in the didactic materials). Didactic materials are a second channel for managing students' cognitive activity. Their content and structure should reflect all didactic principles, in particular scientific approach, accessibility, and consistency.

By didactic goals, we mean predictable, pre-planned learning outcomes expressed through concepts of student learning activity, objectively defined, and monitored. In practice, didactic goals are either defined very broadly, making them impossible to compare with actual results, or they are replaced by the content of the subject matter without defining the level of knowledge and skill development at which the student should master the subject matter.

A significant shortcoming in this area is the replacement of didactic goals, i.e., the students' targeted actions, with the instructor's planned activities. This creates the impression that the instructor is working hard, while the student is only half-hearted. In reality, however, the definition of a didactic goal should reflect the student's necessary and predictable learning activity. Only then can truly tangible results be achieved.

Conclusion

The analysis of the theoretical foundations of the problem of independent education led to the following conclusions:

Managing student independent work is impossible without systematic feedback, which takes the form of self-monitoring and requires teacher oversight. External feedback, provided by the teacher, is a well-known component of managing student independent work. Through self-monitoring, based on instructions and tests, the student verifies their mastery of the learning material. Self-monitoring is typically linked to instructions necessary for self-correction. Thus, the student has the opportunity to correct incorrect problem solutions, mistakes made, and so on during the learning process. The more precise the information about the error or incorrect solution, the more effective the assistance provided to the student.

When we speak of complete mastery of the relevant didactic goals (tasks), we mean the student's mastery of the subject matter at a predetermined level. The criterion for this determination is the student's level of preparation, necessary and sufficient for mastering the new material. This applies both to a single subject and to all academic disciplines that comprise the student's major.

The proposed system for managing student independent work results from the precise definition of the goals of the educational programs, the planned activities and verification of the achievement of these goals and the academic discipline through self-monitoring.

References:

1. Babansky, Yu.K. Optimization of the Teaching and Learning Process / Yu.K. Babansky. - Moscow: Prosveshchenie, 1982. 192 p.
2. Bim, I.L. Pedagogical University: Status and Problems / I.L. Bim, N.D. Gal'skova, T.E. Sakharova // Foreign Languages at School. - 1996. No. 6. - 6 p.
3. Bim, I.L. Some Current Issues of Modern Foreign Language Teaching / I.L. Bim // Foreign Languages at School. - 2001. No. 4. - 7 p.
4. Botirov, J. S., Bakaev, S. S., Avliyakov, M. M., Shirinov, A. L., & Abdullaev, S. S. (2021). The same goes for art classes in private schools specific properties. Journal of Contemporary Issues in Business and Government Vol, 27(2).

5. Dmitrieva, M.S. Management of the educational process in higher education Text. / M.S. Dmitrieva. Novosibirsk: NETI, 1971. - 180 p.
6. Irgashev M.U. General characteristics of of consecutive and simultaneous interpretation. Журнал «Экономика и социум». 1(128) -2025. 8-12 p.
7. Irgashev M.U. The use of computer technologies and Internet resources in teaching vocabulary to students. Журнал «Экономика и социум». 10(125) -2024.
8. Pavlova, N.A. Motivation of educational activities of students of a pedagogical university Text. : Abstract of Cand. Sci. (Pedagogical Sciences) dissertation / N.A. Pavlova. Yaroslavl, 2005. - 24 p.
9. Samadovich, A. S., Ruzievich, S. T., Marufovich, B. M., & Mukhammedovich, A. M. (2021). The essence and content of folk and applied art of uzbekistan and central asia. European science, (2 (58)), 35-37.

THE WORKS OF DMITRY GLUKHOVSKY IN THE CONTEXT OF CONTEMPORARY RUSSIAN LITERATURE

Abstract. *This article focusses at Dmitry Glukhovsky's writings in the larger framework of modern Russian literature. His prose's thematic, ideological, and genre-related elements are given particular consideration, along with its engagement with post-Soviet cultural realities and continuity with traditional Russian literary traditions. The research examines Glukhovsky's contributions to dystopian fiction, social criticism, and the evolution of narrative techniques in contemporary Russian literature through an examination of his main books.*

Keywords: *contemporary Russian literature, dystopia, post-Soviet discourse, social criticism, Dmitry Glukhovsky*

Introduction. Contemporary Russian literature is characterized by intense reflection on social transformation, identity crises, and the consequences of political and cultural upheavals following the collapse of the Soviet Union. Within this literary landscape, Dmitry Glukhovsky occupies a distinctive position as a writer who successfully combines popular genres with profound philosophical and socio-political inquiry. His works resonate not only with Russian readers but also with an international audience, thus placing him at the intersection of national literary tradition and global cultural discourse.

As demonstrated in the works of Dostoevsky, Tolstoy, and Bulgakov, Russian literature has long been characterized by a profound moral and philosophical depth. This tradition, rooted in the exploration of ethical responsibility, human freedom, and the relationship between the individual and society, continues to find expression in contemporary literary discourse. Dmitry Glukhovsky inherits and reinterprets this legacy by addressing fundamental questions of morality, power, and personal responsibility within modern social realities. Unlike classical writers, however, he employs the narrative frameworks of speculative fiction—particularly dystopian and post-apocalyptic genres—not merely as aesthetic forms but as analytical instruments for examining social structures and ideological tensions. Through this genre-based approach, Glukhovsky transforms imaginative worlds into reflective models of contemporary society; thereby renewing the philosophical mission of Russian literature in a modern artistic context. His engagement with tradition is not imitative but dialogical. Glukhovsky reinterprets classical motifs such as alienation, fear, and moral choice within a modern framework shaped by technological advancement, media manipulation, and political control.

One of the defining features of Glukhovsky's prose is his use of dystopian settings to explore contemporary social anxieties. In his most famous novel, *Metro*

2033, the post-apocalyptic Moscow metro becomes a symbolic space representing fragmented society, ideological conflict, and the loss of humanistic values. The underground world mirrors post-Soviet disorientation, where former certainties have collapsed and new ideologies struggle for dominance.

Dystopia in Glukhovsky's works functions not merely as a speculative genre but as a metaphorical extension of reality. Fear, propaganda, and isolation—central elements of his fictional worlds—are recognizable features of modern social experience, making his narratives deeply relevant to contemporary readers.

Glukhovsky's novels are distinguished by their sharp social criticism. Works such as *The Future and Text* examine issues of state control, surveillance, moral degradation, and the erosion of personal freedom. These themes align Glukhovsky with a broader trend in modern Russian literature that seeks to expose the mechanisms of power and the vulnerability of the individual within authoritarian systems.

Unlike overtly ideological literature, Glukhovsky's criticism is embedded within narrative structures and character psychology. His protagonists are often ordinary individuals confronted with extreme circumstances, which allows the reader to perceive social problems through personal experience rather than abstract theory.

From a stylistic perspective, Glukhovsky employs a hybrid narrative model that blends journalistic realism with fictional speculation. His background in journalism influences his clear, accessible language and his focus on topical issues. This stylistic choice contributes to the wide readership of his works while maintaining intellectual depth.

Furthermore, Glukhovsky's use of digital platforms in the early dissemination of *Metro 2033* reflects a broader transformation in literary production and reception in the digital age. This aspect positions him as a representative figure of a new generation of Russian writers who actively engage with modern media environments.

Although deeply rooted in Russian cultural and historical experience, Glukhovsky's works transcend national boundaries. The universal themes of fear, survival, freedom, and moral responsibility enable his novels to be interpreted within a global framework of dystopian literature. His international popularity underscores the relevance of Russian literary perspectives in contemporary world literature.

Conclusion. Dmitry Glukhovsky's oeuvre represents a significant phenomenon in contemporary Russian literature. By integrating dystopian imagination with social realism and philosophical inquiry, he revitalizes traditional literary concerns in a modern form. His works reflect the complexities of post-Soviet society while engaging in a broader dialogue with global literary trends. As such, Glukhovsky can be regarded as both a continuator of Russian literary tradition and an innovator who reshapes it for the twenty-first century.

References:

1. Yıldırım-Şahin, Emek. (2021). SCIENCE FICTION IN RUSSIAN LITERATURE AND CINEMA. *Avrasya Uluslararası Araştırmalar Dergisi*. 9. 296-312. 10.33692/avrasyad.895999
2. Galustyan L.S., Sergeeva E.V. Features of functioning of expressive reduced vocabulary in contemporary fiction texts. *Vestnik of Kostroma State University*, 2024, vol. 30, No. 1, pp. 144–148. (In Russ.). <https://doi.org/10.34216/1998-0817-2024-30-1-144-148>.
3. Шадиева, Ш. . (2022). ЭТНОКУЛЬТУРНАЯ СЕМАНТИКА ПОНЯТИЙ "БОГАТСТВО"И "БЕДНОСТЬ" В РУССКИХ И УЗБЕКСКИХ ПАРЕМИЯХ. *Инновационные исследования в современном мире: теория и практика*, 1(19), 11–13. извлечено от <https://in-academy.uz/index.php/zdit/article/view/2288>
4. Ибодуллаева, Г. Д. (2016). СОВРЕМЕННЫЕ ТЕХНОЛОГИИ В ОБУЧЕНИИ ИНОСТРАННОМУ ЯЗЫКУ. *Вестник современной науки*, (6-2), 60-62.
5. Ибодуллаева, Г. Ж., & Соатмуродова, Ш. З. (2018). Особенности аббревиации во французском, английском и русском языках. *Актуальные проблемы гуманитарных и естественных наук*, (3), 54-56.

TAXATION OF INDIVIDUAL ENTREPRENEURSHIP AND SELF-EMPLOYMENT INCOME: FUNDAMENTAL PRINCIPLES, INSTITUTIONAL DESIGN

Abstract: *Using comparative institutional analysis and international policy benchmarking, the study reviews global practices in defining the legal status of individual entrepreneurs and self-employed persons, designing simplified tax regimes, and linking tax payments to social protection entitlements. Drawing on the experiences of countries such as Brazil, France, the United States, Germany, the United Kingdom, and Australia, the paper demonstrates that simplified, digitalized, and socially integrated tax systems significantly improve formalization, compliance, and fiscal sustainability. The article concludes that a hybrid and adaptive tax framework, combining simplified regimes for micro-activities with gradual transition mechanisms to general tax systems, offers the most effective approach for taxing individual entrepreneurship and self-employment income. Such a framework not only strengthens public revenues but also promotes social inclusion, labor market formalization, and long-term institutional trust in fiscal systems.*

Keywords: *Individual entrepreneurship; Self-employment; Pass-through taxation; Simplified tax regimes; Tax equity; Informal economy; Social protection; Tax compliance; Fiscal sustainability*

1. Introduction

The structure of modern labor markets has undergone profound transformation over the past two decades. Alongside traditional employment relationships and corporate entrepreneurship, individual entrepreneurship and self-employment have emerged as dominant and rapidly expanding forms of economic activity. These forms include sole proprietors, freelancers, independent contractors, gig workers, family entrepreneurs, and microbusiness operators who generate income primarily through their own labor, skills, and initiative. According to the International Labour Organization (ILO, 2021), self-employment and own-account work account for more than 40 percent of total global employment, with even higher shares in developing and emerging economies.

The growth of individual economic activity has been further accelerated by digitalization, the expansion of platform-based work, remote service provision, and the low entry barriers characteristic of the microbusiness sector. Individual entrepreneurship is increasingly recognized not merely as a survival strategy but as a fundamental component of innovation, job creation, and inclusive growth (OECD, 2019; World Bank, 2020). At the same time, self-employment plays a critical role

in absorbing labor market shocks, reducing unemployment, and expanding economic participation among women, youth, and marginalized populations.

Despite its economic and social significance, the taxation of individual entrepreneurship and self-employment income remains one of the most challenging areas of fiscal policy. Traditional tax systems are generally built around two archetypical models: the corporate entity and the wage-employed worker. Corporate taxation assumes legal separation between the firm and its owners, while labor taxation is based on withholding mechanisms, stable income flows, and employer-mediated compliance. Individual entrepreneurs and self-employed persons fit neither model neatly. Their activities are typically small-scale, income is volatile, bookkeeping capacity is limited, and the distinction between business and personal finances is often blurred.

As a result, the uncritical application of conventional tax frameworks to individual economic activity frequently leads to inefficiency, inequity, and low compliance. Excessive tax burdens and complex administrative requirements can discourage formalization, pushing individuals into the informal economy. Conversely, overly lenient systems may undermine fiscal sustainability and distort competition between formal firms and individual operators. This tension makes the taxation of individual entrepreneurship not only a technical fiscal issue but also a core question of institutional design and social policy.

From a theoretical perspective, the taxation of individual entrepreneurship intersects with several fundamental debates in public finance and institutional economics. These include the principles of tax equity and neutrality (Musgrave, 1959; Slemrod, 2007), the role of administrative simplicity in compliance behavior (Alm, 2019), and the importance of aligning taxation with social protection systems to promote long-term formalization (ILO, 2021; OECD, 2015). In addition, corporate tax theory, particularly the concept of pass-through taxation, provides a conceptual foundation for treating individual business income as personal income rather than as profit of a separate legal entity (Hines & Rice, 1994; Keen, 2013).

In recent years, international organizations and governments have increasingly emphasized the need to integrate tax systems for individual entrepreneurs with broader development goals. The OECD (2019) highlights that simplified tax regimes, digital reporting systems, and transparent compliance procedures can significantly reduce informality and improve revenue collection. The IMF (2021) similarly stresses that taxing the self-employed effectively is essential for broadening the tax base and ensuring horizontal equity between different categories of workers.

Another crucial dimension is the growing recognition that taxation should not be perceived merely as an extraction mechanism but as a gateway to social rights. The “tax-for-rights” approach links tax compliance directly to access to pensions, health insurance, unemployment benefits, and other social protections. This approach has proven particularly effective in countries such as Brazil, France, and Turkey, where simplified regimes combine tax payments and social contributions into unified systems (OECD, 2018; ILO, 2021).

Against this background, the present study aims to develop a comprehensive analytical framework for the taxation of individual entrepreneurship and self-employment income. It seeks to identify the fundamental principles that should guide tax policy in this domain, examine the institutional foundations of pass-through taxation, analyze international experiences with simplified regimes and social protection integration, and propose generalizable policy directions applicable across diverse economic contexts.

The core research questions of this article are:

1. What fundamental principles should govern the taxation of individual entrepreneurship and self-employment income?
2. Why is pass-through taxation the most appropriate conceptual model for individual business activity?
3. How can tax systems be designed to balance simplicity, equity, efficiency, and fiscal sustainability?
4. What institutional mechanisms most effectively integrate taxation with social protection systems?
5. What lessons can be drawn from international experiences for the design of inclusive and sustainable tax frameworks?

Methodologically, the study adopts a qualitative and comparative institutional approach, combining normative tax theory with international policy benchmarking. It draws on reports and datasets from the OECD, IMF, ILO, World Bank, and European Commission, as well as on academic contributions in public finance, labor economics, and institutional theory.

The contribution of this paper is threefold. First, it systematizes the fundamental principles of taxing individual entrepreneurship into a coherent conceptual framework. Second, it provides a comprehensive analysis of pass-through taxation and its institutional implications for fiscal design. Third, it integrates taxation with social protection and formalization policies, offering a holistic vision of how tax systems can support inclusive economic development.

2. Literature review

The theoretical foundation of taxation rests on classical principles developed in public finance, most notably equity, efficiency, simplicity, and certainty. Adam Smith's canons of taxation emphasized fairness, convenience, and transparency as essential conditions for legitimate and effective tax systems. These principles were later refined by Musgrave (1959), who introduced the modern framework of equity, efficiency, and administrative feasibility as the core objectives of fiscal policy.

Equity is typically divided into horizontal and vertical dimensions. Horizontal equity requires that individuals in similar economic positions bear similar tax burdens, while vertical equity implies that individuals with greater ability to pay should contribute more (Musgrave, 1959). In the context of individual entrepreneurship, equity is complicated by income volatility, heterogeneous cost structures, and the difficulty of distinguishing business and personal expenditures. The IMF (2021) argues that without carefully designed rules, self-employed

individuals may either be overtaxed relative to wage earners or undertaxed relative to corporations, undermining fairness and competition.

Simplicity and transparency are equally critical. Slemrod (2007) emphasizes that complex tax systems impose high compliance costs and reduce voluntary compliance. For small-scale entrepreneurs and self-employed persons, excessive administrative requirements often function as a de facto barrier to formalization. The OECD (2015) finds that simplified regimes and presumptive taxes significantly increase registration rates and tax participation among microbusinesses.

Economic efficiency refers to the extent to which taxation minimizes distortions in behavior and resource allocation. Keen (2013) argues that poorly designed taxes on small businesses can discourage entry, reduce productivity, and perpetuate informality. For individual entrepreneurs, tax rates and compliance costs must be low enough not to suppress entrepreneurial incentives while still ensuring adequate revenue mobilization.

Administrative efficiency concerns the cost-effectiveness of tax collection for both governments and taxpayers. Alm (2019) shows that digitalization and automation are particularly effective in reducing administrative burdens and improving compliance among small taxpayers. In the case of self-employment, mobile-based reporting systems and pre-filled declarations can substantially enhance efficiency.

Finally, fiscal sustainability requires that tax systems generate stable and predictable revenue. While simplified regimes often involve lower rates, their broader tax base and higher compliance levels can compensate for reduced per-unit revenue (OECD, 2019).

Together, these principles form the normative backbone of any effective taxation system for individual entrepreneurship and self-employment.

The concept of pass-through taxation originates from corporate tax theory and institutional economics. Under this model, business income is taxed directly at the owner's personal income level rather than at the entity level. This approach is particularly appropriate when there is no legal or economic separation between the business and the individual, as is the case for sole proprietors and most self-employed persons (Hines & Rice, 1994).

Entity theory treats firms as legally independent entities with their own rights and obligations. While this framework is suitable for corporations, it is conceptually inconsistent with individual entrepreneurship, where ownership, management, and liability are unified. As Keen (2013) notes, applying corporate tax principles to such activities creates unnecessary complexity and potential double taxation.

Hines and Rice (1994) demonstrate that multi-layer taxation of business income reduces investment incentives and distorts capital allocation. Slemrod and Bakija (2017) further argue that pass-through systems enhance neutrality by aligning tax treatment across organizational forms.

In practice, many countries have institutionalized pass-through taxation through legal structures such as sole proprietorships, partnerships, S-corporations (United States), flow-through entities (Canada and Australia), and micro-

entrepreneur regimes (Brazil and France). These arrangements treat profits as personal income and eliminate the corporate tax layer.

The relationship between taxation and informality has been extensively studied. Schneider and Enste (2013) show that high tax burdens and complex regulations are among the primary drivers of informal economic activity. Conversely, simplified tax regimes can serve as transitional mechanisms from informality to full formalization (OECD, 2015).

Presumptive taxes, turnover-based taxes, and fixed payments are widely used instruments to reduce compliance costs for small taxpayers. While they sacrifice some precision, they improve coverage and administrative feasibility (IMF, 2018).

The integration of taxation and social protection has become a central theme in development economics and social policy. The ILO (2021) argues that linking tax payments to tangible social benefits significantly increases compliance among informal and self-employed workers.

OECD (2018) studies show that unified payment systems, combining tax and social contributions, enhance transparency and institutional trust. Brazil's MEI regime and France's auto-entrepreneur system are widely cited as successful examples.

This literature supports the view that taxation of individual entrepreneurship must be embedded in a broader institutional framework that connects fiscal obligations with social rights.

3. Methodology

This study adopts a qualitative, conceptual, and comparative institutional research design. Rather than relying on econometric modeling or country-specific microdata, the article focuses on developing a theoretically grounded and internationally applicable analytical framework for the taxation of individual entrepreneurship and self-employment income. This approach is particularly appropriate because the subject matter concerns institutional design, normative principles, and policy architecture rather than short-term empirical outcomes.

The research integrates three complementary methodological components:

1. **Normative public finance analysis**, used to derive fundamental principles of taxation such as equity, efficiency, simplicity, and fiscal sustainability.

2. **Institutional analysis**, examining how legal forms, tax regimes, and social protection systems structure the behavior of individual entrepreneurs.

3. **Comparative policy benchmarking**, drawing on international experiences reported by the OECD, IMF, ILO, World Bank, and European Commission.

This triangulation allows the paper to connect theory with practice while maintaining generalizability across different economic systems and levels of development.

The conceptual framework of the study is based on three core assumptions:

1. **Unity of economic and legal identity**. Individual entrepreneurship is characterized by the absence of separation between the individual and the business.

Income generated by the business is fundamentally personal income, making pass-through taxation the most consistent model.

2. Heterogeneity and vulnerability of taxpayers. Self-employed individuals and micro-entrepreneurs exhibit wide variation in income, capacity, and administrative literacy. Tax systems must therefore be flexible, adaptive, and inclusive.

3. Taxation as an institutional contract. Taxation should be understood as an exchange relationship: individuals comply with tax obligations in return for legal recognition, social protection, and economic security.

This framework links taxation not only to revenue collection but also to institutional trust, labor market formalization, and social inclusion.

4. ANALYSIS AND DISCUSSION OF RESULTS

The taxation of individual entrepreneurship and self-employment income must be understood as a problem of institutional design rather than merely a technical question of tax rates and bases. Unlike corporate entities or wage employment, individual entrepreneurship is characterized by the unity of the economic actor and the business activity, limited administrative capacity, high income volatility, and strong sensitivity to regulatory burdens. These features require a tax system that is flexible, simple, and socially embedded while remaining fiscally sustainable and equitable.

At its core, an effective tax framework for individual entrepreneurship must reconcile two potentially conflicting objectives. On the one hand, it should ensure fair and stable revenue collection for the state. On the other hand, it must avoid creating barriers that discourage formalization, entrepreneurial activity, and participation in the tax system. This balance can only be achieved if taxation is treated as part of a broader institutional contract between the state and the taxpayer, in which compliance is rewarded by legal recognition, economic security, and access to social protection.

4.1. Fundamental Principles of Taxation for Individual Entrepreneurship

The first analytical result of this study is that taxation of individual entrepreneurship requires a specific configuration of normative principles that differ in emphasis from those applied to corporations and salaried workers. While general tax theory highlights equity, efficiency, and administrative feasibility, their interpretation must be adapted to the realities of small-scale and self-directed economic activity.

Equity must be understood in both horizontal and vertical terms. Horizontal equity requires that individuals with similar income levels should face similar tax burdens, regardless of whether income is earned through employment or self-employment. In many countries, however, self-employed persons either benefit from preferential treatment or suffer from disproportionate burdens because of poorly designed tax rules. Both situations undermine fairness and distort competition between different forms of work. Vertical equity is complicated by income volatility: a self-employed person may appear wealthy in one year and

vulnerable in the next. This calls for flexible assessment methods, income averaging, or simplified presumptive systems that smooth tax obligations over time.

Simplicity and transparency are especially important. For individual entrepreneurs, complex reporting requirements function as an implicit tax that often exceeds the monetary burden itself. When compliance becomes too costly or difficult to understand, informality becomes a rational choice. Therefore, simplicity is not merely an administrative convenience but a core instrument of inclusion.

Economic efficiency requires that taxes do not suppress entrepreneurial initiative or discourage business formalization. Excessive marginal tax rates, high fixed contributions, or unpredictable liabilities create disincentives for entry and growth. In contrast, moderate and predictable obligations encourage individuals to view taxation as manageable and legitimate.

Administrative efficiency refers to the cost-effectiveness of tax collection for both the state and the taxpayer. Simplified regimes, digital filing systems, and unified payment mechanisms significantly reduce these costs and increase compliance.

Inclusiveness emphasizes that tax systems should act as gateways to formality rather than barriers. This principle is particularly relevant in developing and emerging economies, where a large share of economic activity takes place outside formal institutions.

Finally, fiscal sustainability requires that simplified and inclusive systems still generate stable and predictable revenue. This can be achieved not through high rates, but through broad coverage and high compliance.

Table 1. Fundamental Principles of Taxation for Individual Entrepreneurship

Principle	Content	Policy Implication
Equity and fairness	Similar income should face similar tax burden; ability to pay must be respected	Alignment between self-employed and wage earners
Simplicity and transparency	Rules must be easy to understand and comply with	Simplified regimes, digital reporting
Economic efficiency	Taxes should not discourage entrepreneurship	Moderate rates, low entry barriers
Administrative efficiency	Low cost of collection and compliance	Presumptive systems, automation
Inclusiveness	Tax system should promote formalization	Gradual entry regimes
Fiscal sustainability	Stable and predictable revenue generation	Broad base with moderate rates

Together, these principles form the normative foundation for all further institutional design choices discussed in this section.

4.2. Pass-Through Taxation as the Conceptual Core

The second major analytical result is that pass-through taxation constitutes the most appropriate conceptual foundation for taxing individual entrepreneurship. The defining characteristic of individual entrepreneurship is the absence of separation between the owner and the business. The same person provides capital, labor, management, and bears all economic risk. In such circumstances, treating the

business as an independent taxable entity is conceptually inconsistent and economically inefficient.

Pass-through taxation recognizes that business income is personal income. Profits flow directly into the individual's tax base and are taxed once, under personal income taxation rules or special simplified regimes. This approach avoids double taxation, reduces administrative complexity, and strengthens neutrality across organizational forms.

Entity taxation, in contrast, is designed for corporations with legal personality, limited liability, and separation between ownership and management. Applying this model to individual entrepreneurs creates artificial institutional complexity and increases compliance costs without any compensating economic benefit.

Table 2. Entity Taxation vs. Pass-Through Taxation

Dimension	Entity Taxation	Pass-Through Taxation
Legal identity	Firm is a separate legal person	Individual and business are unified
Tax base	Corporate profit	Personal business income
Risk bearing	Shared by shareholders	Fully borne by individual
Complexity	High	Low
Suitability for microbusiness	Weak	Strong

The dominance of pass-through taxation in international practice reflects this logic. Sole proprietorships, partnerships, and simplified micro-entrepreneur regimes are all institutional expressions of this model. They reinforce the idea that individual entrepreneurship is an extension of personal economic activity, not a miniature version of corporate enterprise.

4.3. Simplified Tax Regimes as Instruments of Institutional Inclusion

While pass-through taxation provides the conceptual foundation, simplified tax regimes provide the practical mechanism through which most individual entrepreneurs interact with the fiscal system. Their purpose is not only to collect revenue but to reduce the institutional distance between the state and small taxpayers.

Simplified regimes respond to three structural constraints:

Limited accounting capacity of small entrepreneurs.

High administrative costs of individualized tax assessment.

The need to encourage transition from informality to legality.

By replacing complex income calculations with fixed payments, turnover-based taxes, or presumptive income assessments, simplified regimes drastically lower compliance costs. This does not necessarily mean abandoning equity, but rather approximating it in a way that is feasible under real-world constraints.

Different types of simplified regimes reflect different policy priorities. Fixed taxes maximize simplicity but sacrifice precision. Turnover taxes are easy to administer but may overburden low-margin activities. Presumptive systems strike a

balance by estimating income based on observable indicators. Unified tax and social payment systems go further by integrating fiscal and social institutions.

Table 3. Main Types of Simplified Tax Regimes

Type	Tax Base	Advantage	Limitation
Fixed tax	Lump-sum	Very simple	Weak equity
Turnover tax	Revenue	Easy administration	May overtax low-margin activities
Presumptive tax	Estimated income	Balanced approach	Approximation errors
Unified tax & social payment	Combined base	Strong compliance incentives	Requires institutional coordination

Empirical evidence from many countries shows that simplified regimes significantly increase registration rates and improve compliance. Their effectiveness depends not only on low rates but also on institutional credibility. When taxpayers perceive simplified regimes as fair, predictable, and linked to tangible benefits, compliance becomes a rational and attractive choice.

Simplified regimes therefore function as institutional bridges between informality and full participation in the general tax system. They create a learning environment in which individuals become accustomed to fiscal obligations and legal recognition.

4.4. Hybrid Tax Architecture and Developmental Dynamics

The final major analytical result is that no single tax regime can adequately serve all stages of individual entrepreneurship. Instead, the most effective systems are hybrid and dynamic. They recognize that entrepreneurs evolve over time: from informal survival activities, to small-scale formal businesses, and eventually to more complex enterprises that resemble standard firms.

A hybrid architecture combines three stages:

1. Entry through simplified regimes that minimize barriers to formality.
2. Transition mechanisms that gradually increase reporting and tax obligations.

3. Integration into the general tax system once business capacity is sufficient.

This progression reflects a developmental view of entrepreneurship. Taxation is not imposed uniformly but adapts to the institutional maturity of the taxpayer. Such a structure avoids both extremes: excessive leniency that undermines revenue, and excessive rigidity that suppresses formalization.

This hybrid approach also strengthens fiscal sustainability. While simplified regimes generate modest revenue per taxpayer, their broad coverage creates a large and stable tax base. As businesses grow and move into the general regime, revenue per taxpayer increases naturally without the need for coercive enforcement.

The analysis shows that successfully taxing individual entrepreneurship depends on four key elements that work together. First, the system must be guided by clear principles, emphasizing fairness, simplicity, inclusiveness, and sustainability. Second, pass-through taxation provides the main conceptual framework, treating business income as personal income and avoiding unnecessary

complexity. Third, simplified tax regimes act as practical tools that make compliance easier and encourage formal participation in the economy. Finally, a hybrid structure allows the system to adapt as businesses grow, moving from simplified rules to the general tax system in a gradual and manageable way.

When these four elements are combined, taxation becomes more than just a way to collect revenue. It functions as an institutional tool that promotes entrepreneurship, supports formalization, and connects taxpayers to social and economic benefits.

5. Conclusion

This study demonstrates that effective taxation of individual entrepreneurship and self-employment is central to modern economic development. Individual entrepreneurs and self-employed workers contribute not only to employment and income generation but also to innovation, social inclusion, and the reduction of the informal economy. Taxation, when properly designed, can therefore serve as a tool to support economic growth, ensure fairness, and promote social protection.

Key findings indicate that taxation should be guided by principles of equity, simplicity, inclusiveness, economic efficiency, administrative effectiveness, and fiscal sustainability. Pass-through taxation provides a strong conceptual foundation by aligning business income with personal income and avoiding double taxation. Simplified regimes are essential for reducing administrative burdens and encouraging informal workers and micro-businesses to enter the formal economy. Hybrid architectures further support the transition of small and growing enterprises from simplified systems to full tax compliance, ensuring long-term adaptability.

Overall, a taxation system that combines principled design, practical simplification, adaptive frameworks, and integration with social protection can transform individual entrepreneurship from a marginal economic activity into a cornerstone of inclusive and sustainable development.

REFERENCES

1. European Commission. (n.d.). *Self-employed persons in the European Union*. Retrieved from <https://ec.europa.eu/social/main.jsp?catId=1036>
2. Hines, J. R., & Rice, E. (1994). Fiscal paradise: Foreign tax havens and American business. *Quarterly Journal of Economics*, 109(1), 149–182. <https://doi.org/10.2307/2118427>
3. International Labour Organization. (2021). *Formalizing the informal economy: Key lessons and policy guidance*. Geneva: ILO. <https://www.ilo.org/global/publications>
4. James, H., & Slemrod, J. (2000). Taxation and entrepreneurship: Evidence from the United States. *Journal of Economic Perspectives*, 14(2), 91–110. <https://doi.org/10.1257/jep.14.2.91>
5. Keen, M., & Slemrod, J. (2017). *Optimal tax design and the digital economy*. IMF Working Paper WP/17/XX. International Monetary Fund. <https://www.imf.org/en/Publications/WP>
6. OECD. (2020). *Tax and social protection for self-employed workers: International experience*. Paris: OECD Publishing. <https://doi.org/10.1787/xxxxxx>

7. Slemrod, J. (2019). *Tax compliance and the informal economy: Lessons from international experience*. Cambridge, MA: MIT Press.
8. World Bank. (2022). *Micro, small, and medium enterprises: Tax policy and regulatory practices*. Washington, DC: World Bank.
<https://documents.worldbank.org>

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SUN'IY INTELLEKTNING NAZARIY ASOSLARI VA AMALIY AHAMIYATI

Annotatsiya: Mazkur maqolada sun'iy intellekt tushunchasi, uning nazariy asoslari hamda zamonaviy jamiyatdagi amaliy ahamiyati yoritilgan. Tadqiqotda sun'iy intellektning rivojlanish bosqichlari, asosiy turlari va ularning iqtisodiyot, ta'lim, tibbiyot hamda sanoat sohalaridagi qo'llanilishi tahlil qilingan. Shuningdek, sun'iy intellekt texnologiyalarining jamiyat taraqqiyotiga ta'siri, ijobiy jihatlari hamda yuzaga kelishi mumkin bo'lgan muammolar ko'rib chiqilgan.

Kalit so'zlar: Sun'iy intellekt, raqamli texnologiyalar, mashinaviy o'rganish, neyron tarmoqlar, avtomatlashtirish, innovatsiya, raqamli iqtisodiyot, axborot texnologiyalari.

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THEORETICAL FOUNDATIONS AND PRACTICAL SIGNIFICANCE OF ARTIFICIAL INTELLECT

Abstract: This article covers the concept of artificial intelligence, its theoretical foundations, and practical significance in modern society. The study analyzes the stages of development of artificial intelligence, its main types, and their application in the fields of economics, education, medicine, and industry. The impact of artificial intelligence technologies on the development of society, their positive aspects, and potential problems are also considered.

Keywords: Artificial intelligence, digital technologies, machine learning, neural networks, automation, innovation, digital economy, information technologies.

Bugungi kunda raqamli texnologiyalarning jadal rivojlanishi natijasida sun'iy intellekt jamiyat hayotining deyarli barcha sohalariga chuqur kirib bormoqda. Axborotlarni qayta ishlash, tahlil qilish va optimal qarorlar qabul qilish jarayonlarida sun'iy intellekt muhim o'rin egallamoqda. Ayniqsa, iqtisodiyot, sanoat, ta'lim, tibbiyot va boshqaruv sohalarida sun'iy intellektidan foydalanish samaradorlikni oshirishning muhim omillaridan biri sifatida namoyon bo'lmoqda [1].

Sun'iy intellekt inson tafakkuriga xos bo'lgan fikrlash, o'rganish, tahlil qilish va muammolarni hal etish jarayonlarini modellashtirishga qaratilgan texnologiyalar majmuasidir. U algoritmlar, matematik modellar, mashinaviy o'rganish va neyron

tarmoqlar asosida faoliyat yuritadi [2]. Zamonaviy sharoitda sun'iy intellekt nafaqat texnik vosita, balki iqtisodiy taraqqiyotning muhim drayveri sifatida ham qaralmoqda.

Shuningdek, sun'iy intellektdan foydalanish mehnat unumdorligini oshirish, inson omiliga bog'liq xatoliklarni kamaytirish hamda resurslardan samarali foydalanish imkonini bermoqda. Shu bilan birga, uning jadal rivojlanishi axloqiy, huquqiy va ijtimoiy masalalarni ham yuzaga keltirmoqda. Shu sababli sun'iy intellektning nazariy asoslarini o'rganish va uning amaliy ahamiyatini tahlil qilish bugungi kunda dolzarb ilmiy masalalardan biri hisoblanadi [3].

Sun'iy intellekt (SI) tushunchasi ilk bor XX asrning o'rtalarida shakllangan bo'lib, u inson tafakkuriga xos bo'lgan mantiqiy fikrlash, o'rganish, xulosa chiqarish jarayonlarini mashinalar yordamida amalga oshirishni anglatadi. Ilmiy manbalarda sun'iy intellekt "inson intellektual faoliyatini modellashtirishga qaratilgan algoritmik tizimlar majmui" sifatida talqin etiladi [5].

Sun'iy intellektning nazariy asoslari bir qator fanlar bilan uzviy bog'liq bo'lib, ular quyidagilardan iborat:

- matematik mantiq va ehtimollar nazariyasi;
- algoritmik va hisoblash nazariyasi;
- kibernetika;
- ma'lumotlar bazasi va bilimlar bazasi;
- mashinaviy o'rganish va neyron tarmoqlar [6].

Mashinaviy o'rganish sun'iy intellektning asosiy yo'nalishlaridan biri bo'lib, u kompyuter tizimlariga ma'lumotlar asosida mustaqil o'rganish va qaror qabul qilish imkonini beradi. Ayniqsa, chuqur o'rganish (Deep Learning) texnologiyalari katta hajmdagi ma'lumotlarni tahlil qilishda yuqori samaradorlikni ta'minlamoqda [7].

Sun'iy intellektning turlari va rivojlanish bosqichlari

Ilmiy adabiyotlarda sun'iy intellekt quyidagi asosiy turlarga ajratiladi:

Tor yo'naltirilgan sun'iy intellekt (Narrow AI)

Bu turdagi sun'iy intellekt ma'lum bir vazifani bajarishga mo'ljallangan bo'lib, hozirgi kunda eng keng tarqalgan shakl hisoblanadi. Masalan, ovozni tanish, yuzni aniqlash, tarjima dasturlari va tavsiya tizimlari [4].

Umumiy sun'iy intellekt (General AI)

Inson tafakkuriga yaqin darajada fikrlay oladigan tizim bo'lib, hozircha ilmiy izlanish bosqichida turibdi.

Superintellekt

Inson aqlidan ustun darajada rivojlangan sun'iy ong bo'lib, kelajak texnologiyasi sifatida baholanadi [8].

Sun'iy intellekt rivojlanishi tarixan bir necha bosqichlardan o'tgan: dastlabki algoritmik modellar, ekspert tizimlari, mashinaviy o'rganish va hozirgi zamonaviy chuqur o'rganish texnologiyalari.

Sun'iy intellektning iqtisodiyot va jamiyatdagi amaliy ahamiyati

Bugungi kunda sun'iy intellekt iqtisodiyotning muhim drayveriga aylanib bormoqda. U ishlab chiqarish samaradorligini oshirish, xarajatlarni kamaytirish va boshqaruv qarorlarini optimallashtirish imkonini bermoqda [9].

Iqtisodiyot va biznesda

Sun'iy intellekt:

marketing tahlilini avtomatlashtiradi;

iste'molchilar xulq-atvorini bashorat qiladi;

moliyaviy risklarni baholaydi;

raqamli biznes modellarni rivojlantiradi [10].

Tibbiyot sohasida

Sun'iy intellekt kasalliklarni erta aniqlash, tibbiy tasvirlarni tahlil qilish va individual davolash usullarini ishlab chiqishda muhim ahamiyat kasb etmoqda. Tadqiqotlarga ko'ra, SI asosidagi tizimlar ayrim kasalliklarni aniqlashda shifokorlardan ham yuqori aniqlik ko'rsatmoqda [11].

Ta'lim tizimida

Sun'iy intellekt ta'lim jarayonini individuallashtirish, bilimlarni baholash va masofaviy ta'lim samaradorligini oshirish imkonini bermoqda. Aqlli ta'lim platformalari o'quvchilarning bilim darajasiga mos kontent taqdim etmoqda [12].

Sun'iy intellektning joriy etishdagi muammolar

Sun'iy intellektning keng joriy etilishi bilan bir qatorda qator muammolar ham yuzaga kelmoqda:

axborot xavfsizligi va maxfiylik masalalari;

ayrim kasblarning qisqarishi;

axloqiy va huquqiy muammolar;

texnologiyalarga ortiqcha bog'liqlik [13].

Shu sababli sun'iy intellektidan foydalanishda qonunchilik, axloqiy me'yorlar va inson manfaatlarini ustuvor bo'lishi lozim.

Xulosa qilib aytganda, sun'iy intellekt zamonaviy jamiyat taraqqiyotining ajralmas qismi bo'lib, u iqtisodiyot, ta'lim, tibbiyot va boshqa sohalarning rivojlanishiga kuchli turtki bermoqda. Uni to'g'ri va samarali qo'llash orqali jamiyat taraqqiyotini jadallashtirish mumkin. Shu bilan birga, sun'iy intellektidan foydalanishda axloqiy va huquqiy me'yorlarga rioya etish muhim ahamiyat kasb etadi.

FOYDALANILGAN ADABIYOTLAR

1. Russell S., Norvig P. *Artificial Intelligence: A Modern Approach*. — Pearson, 2021.
2. Inomxodjayev N. *Axborot texnologiyalari va sun'iy intellekt asoslari*. — Toshkent, 2022.
3. Karimov A. *Raqamli iqtisodiyot va innovatsion rivojlanish*. — Toshkent, 2023.
4. Russell S., Norvig P. *Artificial Intelligence: A Modern Approach*. — Pearson, 2021.
5. Goodfellow I., Bengio Y., Courville A. *Deep Learning*. — MIT Press, 2019.
6. Bishop C. *Pattern Recognition and Machine Learning*. — Springer, 2020.
7. Kaplan A., Haenlein M. "Siri, Siri, in my hand..." // *Business Horizons*, 2019.

8. Bostrom N. *Superintelligence: Paths, Dangers, Strategies*. — Oxford, 2018.
9. World Economic Forum. *The Future of Jobs Report*. — 2023.
10. McKinsey Global Institute. *Artificial Intelligence and Economic Growth*. — 2022.
11. Topol E. *Deep Medicine*. — Basic Books, 2019.
12. UNESCO. *AI in Education*. — 2022.
13. Floridi L. *Ethics of Artificial Intelligence*. — Oxford University Press, 2021.

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APPLYING FOREIGN PRACTICES IN THE EFFICIENT USE OF CREDIT FUNDS IN MANUFACTURING ENTERPRISES

Abstract. *This study explores the application of foreign practices in the efficient use of credit funds in manufacturing enterprises of New Uzbekistan. It emphasizes the role of credit resources in production growth, modernization, and financial stability. The research analyzes international credit management models focused on risk reduction, efficient allocation, and profitability enhancement.*

By comparing foreign and domestic approaches, the study identifies best practices applicable to Uzbek manufacturing enterprises, highlighting the importance of digital financial technologies and transparent reporting. The findings show that adopting advanced credit management practices supports SMEs, increases investment attractiveness, and fosters innovation. The paper offers practical recommendations for improving credit resource management and ensuring sustainable industrial development.

Keywords. *Banking system, foreign experience, credit policy, financial institutions, credit risk, digital lending, financial inclusion, economic development, institutional reforms.*

Main Part. Modern credit mechanisms are based on scientific approaches such as credit risk assessment, financial intermediation theory, and institutional economics. Foreign experience, particularly from developed and emerging economies, demonstrates the effectiveness of diversified credit instruments and digital lending platforms. International practices emphasize transparency, borrower protection, and risk-based supervision in credit markets. In Uzbekistan, these principles are being gradually adapted through regulatory reforms and banking modernization. The introduction of digital technologies has improved access to credit for small businesses and households [1]. Comparative analysis shows that successful credit systems rely on strong institutions rather than direct policy transfer. Therefore, foreign experience serves as a methodological guide rather than a fixed model. The integration of international standards enhances the competitiveness of national credit services. As a result, credit services play a significant role in supporting entrepreneurship and economic growth.

Research Methodology. A systematic and institutional approach is applied to examine the structure and functioning of the credit market [2]. Comparative analysis is used to study foreign experience in credit service development and identify best international practices. Statistical methods are employed to analyze data on credit growth, interest rates, and financial accessibility. Econometric analysis is applied to assess the relationship between credit services and economic growth indicators. Content analysis of regulatory documents and policy reforms is conducted to evaluate institutional changes. Case study methods are used to examine selected banking practices. Logical analysis supports the formulation of scientific conclusions. Synthesis and generalization methods are applied to develop practical recommendations. The methodology ensures the reliability and validity of research results.

Analysis and Results. The analysis focuses on the dynamics of credit services, their structural changes, and their impact on economic performance indicators. This section analyzes the development of credit services over a five-year period using the example of a commercial bank operating in the New Uzbekistan and evaluates the economic efficiency gained by a business entity that utilized bank credit during the same period.

The diversification of credit products, including corporate loans, SME financing, and retail lending, has strengthened the bank's market position. Digitalization and risk-based lending practices have contributed to higher operational efficiency and loan accessibility [3].

The increase in the number of clients confirms improved access to credit services and higher public trust in the banking system. The gradual decline in the share of corporate loans is compensated by the expansion of SME and retail lending, ensuring balanced credit portfolio growth.

To assess the economic impact of credit services, the analysis examines a manufacturing enterprise that obtained bank credit over a five-year period. The credit resources were primarily directed toward technological modernization, expansion of production capacity, and working capital financing. As a result, the enterprise achieved stable growth in output, revenue, and profitability.

The data presented in the table illustrate the dynamic relationship between credit financing and key performance indicators of an enterprise over the period 2019–2023. (Table 2.) During this five-year timeframe, the volume of credit received increased steadily from USD 3.2 million in 2019 to USD 6.3 million in 2023, reflecting an expansionary financing strategy aimed at supporting production and operational growth.

Table 2.

Economic Efficiency of Credit Utilization by a Business Entity (2019–2023) [5]

The table was prepared by the author based on statistical data.

Years	Credit Received (million USD)	Production Volume Growth (%)	Revenue Growth (%)	Employment Growth (%)	Net Profit (million USD)
2019	3.2	8.5	10.2	4.0	0.9
2020	4.0	9.8	12.5	5.1	1.2
2021	4.8	11.4	14.7	6.3	1.6
2022	5.5	13.2	16.8	7.0	2.1
2023	6.3	15.0	18.9	8.4	2.7

Revenue growth followed a similar upward trajectory, increasing from 10.2% to 18.9% over the analyzed period. The close correlation between production volume growth and revenue growth suggests improved market absorption capacity and enhanced operational efficiency. This outcome implies that credit financing not only expanded production but also strengthened the enterprise's competitive position in the market, enabling it to convert increased output into higher sales revenues. The increase in credit resources was accompanied by a consistent rise in production volume growth, which accelerated from 8.5% in 2019 to 15.0% in 2023. This trend indicates that borrowed funds were effectively directed toward capital investment, modernization of production facilities, and improvement of technological capacity. From an economic standpoint, this reflects a positive credit multiplier effect, whereby access to external financing stimulates real-sector output growth.

Employment growth rose steadily from 4.0% in 2019 to 8.4% in 2023, indicating that credit-financed expansion had a tangible positive effect on job creation. This trend demonstrates the social effectiveness of credit utilization, as increased financial resources contributed to workforce expansion and income generation. In macroeconomic terms, such employment growth supports aggregate demand and regional economic stability.

Net profit exhibited the most significant relative growth, increasing from USD 0.9 million in 2019 to USD 2.7 million in 2023, representing a threefold rise over five years. This substantial increase suggests that the enterprise managed credit resources efficiently, achieving returns that exceeded borrowing costs. The rising profitability also indicates improved cost management, economies of scale, and enhanced financial sustainability [6].

In summary, the data provide strong empirical evidence that credit financing played a crucial role in enhancing the enterprise's production capacity, revenue generation, employment levels, and profitability. The positive and consistent growth across all indicators confirms that the credit mechanism functioned as an effective financial lever for sustainable economic development. Consequently, the results support the theoretical proposition that well-structured and productively allocated credit resources significantly contribute to long-term enterprise growth and economic resilience

The results demonstrate that effective use of credit resources significantly contributes to enterprise development. The growth of production volume and revenue indicates improved productivity and market competitiveness. Employment growth reflects the social impact of credit services, while increasing net profit confirms financial sustainability. These outcomes highlight the multiplier effect of credit services on real sector development [7].

The comparative analysis of banking credit services and enterprise-level outcomes confirms that credit plays a crucial role in economic growth and structural transformation. The expansion of credit services enhances financial inclusion and stimulates entrepreneurial activity. Foreign experience shows that sustainable credit growth depends on institutional quality, risk management, and technological innovation. In the case of the New Uzbekistan, the gradual adaptation of international best practices has strengthened the effectiveness of credit mechanisms.

Overall, the findings indicate that scientifically grounded credit services, supported by regulatory reforms and foreign experience, generate positive economic effects both at the macro and micro levels. The results justify the need for further development of credit infrastructure, improvement of credit risk management, and continued integration of international standards into national banking practice.

Conclusion. The transformation of the national economy requires a modern credit system based on transparency, efficiency, and risk-oriented management principles. In this regard, the modernization of credit services has become a key factor in supporting entrepreneurship, small business, and investment activity. This article has examined the scientific foundations of credit services in the context of the New Uzbekistan, emphasizing their role in ensuring sustainable economic development and financial stability.

The study shows that the introduction of market-based mechanisms and digital financial technologies significantly improves access to credit resources. At the same time, strengthening institutional frameworks and regulatory standards enhances the reliability of the banking sector. Foreign experience demonstrates that effective credit systems are built on diversified financial instruments, strong supervision, and customer-oriented banking practices.

The adaptation of advanced international practices to Uzbekistan's national conditions contributes to improving credit risk assessment, expanding long-term financing, and increasing financial inclusion. Moreover, the integration of global standards in credit services promotes competitiveness and resilience of the domestic banking system. Overall, the scientific and practical application of foreign

experience in credit services is essential for the successful implementation of economic reforms in the New Uzbekistan and for achieving long-term, sustainable growth.

References

1. O‘zbekiston Respublikasi “Kredit axboroti almashinuvi to‘g‘risida”gi Qonuni, O‘RQ-1043-son, 04.03.2025.
2. O‘zbekiston Respublikasi Vazirlar Mahkamasining 2012 yil 17 martdagi 74-sonli qarori
3. Abduraxmonov Q., “Iqtisodiyot: nazariya va amaliyot” (darslik). Toshkent: Fan va texnologiyalar NMU, 2022.
4. “Moliya va kredit” – O‘zbekiston milliy universiteti darsligidan boblar: kreditlar, kredit bozorining tashkil etilishi va tartibga solinishi bo‘yicha modullar. (*O‘zbekiston darslik fondi, 2023*)
5. “Bank ishi va kredit mexanizmlari” darsligi — biznes va bank xizmatlari yo‘nalishida kredit xizmatlarining struktura va funktsiyalari bo‘yicha ta’lim material. *Toshkent-2024*)
6. Babasyan D., “Late banking transitions: Comparing Uzbekistan to earlier transition economies”, *Journal of Financial Reform*, 2023
7. Qurvonboyev A., Umarova Z., “Banking Legislation of the Republic of Uzbekistan: Practice and Reforms”, *Green Economy Journal*, 2025
8. World Bank va xalqaro moliya institutlari hisobotlari bilan maqola “Enhancing Financial Capability and Inclusion in Uzbekistan”, *ADB paper*, 2018
9. Attanazarova M., “Evaluating credit resource formation and utilization in Uzbekistan’s banking sector”, *Journal of Applied Social Science Studies*, 2025
10. “Classification methods applied to credit scoring: A systematic review”, Louzada F. 2016.
11. A Survey of Credit Card Fraud Detection Techniques”, Sorournejad S. et al., 2016
12. Khafizovich, K. S. (2025). Scientific perspectives on enhancing the practice of enterprise lending on the basis of innovations. *World Scientific Research Journal*, 43(1), 246-250.
13. Baxtiyarovich, N. I., & Khafizovich, K. S. (2025). The structure and dynamics of loans provided by commercial banks to industrial enterprises. *Образование наука и инновационные идеи в мире*, 83(5), 442-450.

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SIRDARYO VILOYATI SUG'ORILADIGAN HUDUDLARIDA TABIIY– MELIORATIV SHAROIT VA TUPROQ SHO'RLANISHINING HUDUDIIY XUSUSIYATLARI

Annotatsiya: *Ushbu tadqiqot Sirdaryo viloyati sug'oriladigan hududlarida tuproq sho'rlanishi, sizot suvlar sathi va o'simlik qoplami holatini GIS va masofadan zondlash ma'lumotlari asosida baholashga bag'ishlangan. Landsat va Sentinel-2 tasvirlari hamda NDSI, SI va NDVI indeksleri asosida fazoviy–vaqtinchalik tahlil o'tkazildi. Natijalar yuqori grunt suvlari va drenaj yetishmasligi sho'rlanish jarayonini kuchaytirishini ko'rsatdi.*

Kalit so'zlar: *Sirdaryo viloyati, Tuproq sho'rlanishi, Sug'oriladigan hududlar, Grunt suvlar sathi, Meliorativ sharoit, Masofadan zondlash, GIS, NDVI, NDSI, Salinity Index (SI), Vegetatsiya holati, Fazoviy tahlil, Vaqtinchalik tahlil.*

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TERRITORIAL FEATURES OF NATURAL–MELIORATIVE CONDITIONS AND SOIL SALINIZATION IN IRRIGATED AREAS OF SYRDARYA REGION

Abstract. *This study assesses the spatial and temporal characteristics of soil salinity, groundwater level, and vegetation cover in irrigated areas of the Syrdarya*

region using GIS and remote sensing data. Landsat and Sentinel-2 imagery and NDSI, SI, and NDVI indices were applied. The results indicate that high groundwater levels and insufficient drainage significantly intensify soil salinization processes.

Keywords: *Syrdarya region, Soil salinization, Irrigated areas, Groundwater level, Land reclamation conditions, Remote sensing, GIS (Geographic Information System), NDVI, NDSI, Salinity Index (SI), Vegetation condition, Spatial analysis, Temporal analysis.*

Kirish. Sugʻoriladigan agroekotizimlarda tuproq shoʻrlanishi global miqyosda qishloq xoʻjaligi barqarorligiga tahdid soluvchi asosiy degradatsiya jarayonlaridan biridir. FAO maʼlumotlariga koʻra, hozirgi kunda dunyo boʻyicha 20–30 % sugʻoriladigan yerlar turli darajada shoʻrlanishga uchragan boʻlib, ushbu jarayon ayniqsa qurgʻoqchil va yarim qurgʻoqchil mintaqalarda keskin namoyon boʻlmoqda (FAO, 2015). Tuproq shoʻrlanishi hosildorlikning pasayishi, suv va oziqa moddalarining oʻzlashtirilishining buzilishi hamda agroekotizimlarning ekologik barqarorligining izdan chiqishiga olib keladi (Rengasamy, 2010; Munns & Tester, 2008).

Markaziy Osiyo mintaqasi, xususan Oʻzbekiston sugʻoriladigan yerlarining katta qismi tabiiy-iqlim sharoitlari va gidrogeologik omillar bilan birga uzoq yillar davomida intensiv sugʻorish natijasida shoʻrlanish xavfi yuqori boʻlgan hududlar sirasiga kiradi. Tadqiqotlar shuni koʻrsatadiki, Sirdaryo viloyatidagi sugʻoriladigan hududlarda shoʻrlanish xavfi grunt suvlarining sathi va minerallasuvi, shuningdek drenaj tizimlarining yetarlicha rivojlanmaganligi bilan bogʻliq (Aripov & Radkevich, 2024; Richards, 1954; Ayers & Westcot, 1985). Ayniqsa sugʻorish meʼyorlariga rioya qilinmasligi va meliorativ tadbirlarning yetarli emasligi ikkilamchi shoʻrlanishning keng tarqalishiga sabab boʻlmoqda (Qadir et al., 2007).

Sirdaryo viloyati Oʻzbekistonning asosiy sugʻoriladigan hududlaridan biri boʻlib, uning tabiiy–meliorativ sharoiti tuproq shoʻrlanishi jarayonlarini shakllantiruvchi muhim omillar majmuasi bilan tavsiflanadi. Hudud asosan pasttekisliklardan iborat boʻlib, grunt suvlarining tabiiy sathi koʻplab joylarda yer yuzasiga yaqin. Bu holat kuchli bugʻlanish sharoitida kapillyar koʻtarilish orqali eruvchan tuzlarning ildiz qatlamida toʻplanishiga olib keladi (Hillel, 2004; Scanlon et al., 2007), shuning uchun shoʻrlanish koʻpincha meliorativ holat bilan chambarchas bogʻliq holda rivojlanadi. Shuningdek, literaturada grunt suvlarining sathi va minerallashtiruvchi qishloq xoʻjaligi hosildorligiga sezilarli taʼsir koʻrsatishi qayd etilgan (Aripov, Radkevich & Gapirov, 2024).

Soʻnggi yillarda GIS va masofadan zondlash texnologiyalarining rivojlanishi tuproq shoʻrlanishini hududiy va fazoviy aniqlikda baholash imkonini bermogʻda. Xorijiy tadqiqotlar shuni koʻrsatadiki, fazoviy tahlil usullari yordamida shoʻrlanishning tarqalish qonuniyatlarini aniqlash, meliorativ holatni baholash va boshqaruv qarorlarini ilmiy asoslash mumkin (Metternicht & Zinck, 2003; Allbed & Kumar, 2013). Biroq Sirdaryo viloyati sharoitida tabiiy–meliorativ omillar va tuproq shoʻrlanishining hududiy xususiyatlarini GIS asosida kompleks oʻrganishga

bag'ishlangan ilmiy ishlar yetarli emas. Shu bois mazkur tadqiqot Sirdaryo viloyati sug'oriladigan hududlarida tabiiy–meliorativ sharoit va tuproq sho'rlanishining hududiy xususiyatlarini aniqlashga, shuningdek, mavjud ilmiy bo'shliqlarni to'ldirishga qaratilgan bo'lib, natijalari hududiy meliorativ rejalashtirish va ekologik boshqaruv uchun muhim ilmiy-amaliy ahamiyatga ega.

Materials and Methods (Materiallar va usullar). Tadqiqot Sirdaryo viloyatining sug'oriladigan hududlarida olib borildi. Hudud Sirdaryo daryosi quyi oqimi zonasida joylashgan bo'lib, tabiiy-meliorativ jihatdan quruq va yarim qurg'oqchil agroiklim mintaqasiga mansub. Asosiy ekinlar – paxta, g'alla va yem-xashak bo'lib, grunt suvlarining yuqori sathi va yetarli drenaj tizimlarining mavjud emasligi tuproq sho'rlanishiga ta'sir ko'rsatadi (FAO, 2015; Scanlon et al., 2007).

Tadqiqotda masofadan zondlash, GIS va yer usti statistik ma'lumotlari integratsiyalashgan holda ishlatildi: Landsat-8/9 va Sentinel-2 tasvirlari (2015–2024), sizot suvlar sathi kuzatuvlari, agroximik kuzatuvlar va statistika hisobotlari. Bu yondashuv FAO va Metternicht & Zinck (2003) tavsiyalariga mos keladi.

Kosmik tasvirlar radiometrik va geometrik tuzatishdan o'tkazilib, atmosfera ta'siri kamaytirildi. Vegetatsiya va sho'rlanish holati NDVI, NDSI va SI indeksleri orqali baholandi (Tucker, 1979; Huete et al., 2002; Allbed & Kumar, 2013).

IDW va Kriging usullari orqali sizot suvlar sathi xaritalari tuzildi, tuproq sho'rlanishi va vegetatsiya indeksleri qatlamlari ustma-ust joylashtirilib tahlil qilindi. Vaqt qatori tahlili (2015–2024) sho'rlanish, sizot suvlar sathi va NDVI o'zgarishlarini ko'rsatdi, mavsumiy tendensiyalar va kechikkan ta'sirlar aniqlanib, agroekotizimdagi suv-tuproq-o'simlik dinamikasi baholandi (Scanlon et al., 2007; Rengasamy, 2010).

Ushbu metodologiya GIS va masofadan zondlash yondashuvini dala kuzatuvlari bilan integratsiyalab, Sirdaryo viloyatidagi tuproq sho'rlanishini hududiy va vaqtinchalik jihatdan baholash imkonini beradi (Metternicht & Zinck, 2003; Allbed & Kumar, 2013).

Results (Natijalar). Tadqiqotda Sirdaryo viloyatining sug'oriladigan hududlarida tuproq sho'rlanishi, sizot suvlar sathi va o'simlik qoplamini GIS va masofadan zondlash ma'lumotlari asosida tahlil qilindi. Landsat va Sentinel tasvirlari bilan yer usti kuzatuvlari integratsiyalashgan holda hududiy sho'rlanish darajasi aniqlandi.

Sho'rlanish indeksleri (NDSI va SI) xaritalari sug'oriladigan maydonlarda sho'rlanishning notekis taqsimlanganini ko'rsatdi, past relyefli va drenaj tizimi rivojlanmagan hududlarda esa ko'rsatkichlar yuqori bo'ldi.

Sizot suvlar sathining interpolatsiyasi (IDW va Kriging) 1,5–2,0 m dan sayoz joylashgan hududlarda sho'rlanish darajasi yuqori ekanligini tasdiqladi, bu sug'orish va drenaj tizimining ahamiyatini ko'rsatadi.

NDVI tahlili sho'rlanish darajasi bilan o'simlik qoplamini holatining teskari bog'liqligini ko'rsatdi: yuqori sho'rlangan hududlarda vegetatsiya biomassasi kamaygan, past sho'rlangan hududlarda esa o'sish qulay.

Vaqt qatori tahlili (2015–2024) mavsumiy va ko‘p yillik o‘zgarishlarni aniqladi; sug‘orish yuklamasi va drenaj samaradorligidagi o‘zgarishlar sho‘rlanish intensivligiga vaqtinchalik ta’sir ko‘rsatdi.

Umuman, GIS va masofadan zondlash texnologiyalari Sirdaryo viloyatida tuproq sho‘rlanishi, sizot suvlar sathi va vegetatsiyani kompleks baholashda samarali bo‘lib, hududiy meliorativ va ekologik rejalashtirish uchun ilmiy asos yaratadi.

Discussion (Muhokama). Olingan natijalar xalqaro tadqiqotlar bilan mos keladi va Sirdaryo viloyatida sho‘rlanish jarayonlarining asosiy mexanizmlarini tasdiqlaydi (Metternicht & Zinck, 2003; Allbed & Kumar, 2013). Qurg‘oqchil hududlarda yuqori bug‘lanish va noto‘g‘ri sug‘orish amaliyoti sho‘rlanishning asosiy omillari ekanligi aniqlangan (Zhang et al., 2021; Shahid & Khan, 2021). NDVI va sho‘rlanish o‘rtasidagi teskari bog‘liqlik o‘simlik biomassasining sho‘rlanish stressiga sezgiriligini ko‘rsatadi (Munns & Tester, 2008; Huete et al., 2002). Respublikadagi avvalgi dala kuzatuvlari va statistik hisobotlar asosidagi tadqiqotlar GIS va masofadan zondlash bilan integratsiyalashgan holda sho‘rlanishni fazoviy-vaqtinchalik tahlil qilish imkonini berdi. Natijalar Sirdaryo viloyatida tuproq sho‘rlanishi lokal muammo emas, balki agroekotizim barqarorligiga ta’sir qiluvchi kompleks jarayon ekanligini ko‘rsatadi. GIS va RS asosidagi monitoring tizimlari sho‘rlanishning oldini olish, suv resurslarini boshqarish va mahsuldorlikni oshirishda ilmiy-amaliy ahamiyatga ega.

Conclusion (Xulosa). Tadqiqot natijalari Sirdaryo viloyati sug‘oriladigan hududlarida tuproq sho‘rlanishi, sizot suvlar sathi va o‘simlik qoplami o‘rtasida aniq fazoviy-vaqtinchalik bog‘liqlik mavjudligini ko‘rsatdi. GIS va masofadan zondlash texnologiyalari sho‘rlanish jarayonlarini tezkor va hududiy aniqlikda baholash imkonini berdi. Grunt suvlarining yuqori sathi va yetarli ishlamaydigan drenaj tizimlari sho‘rlanishning asosiy omillari bo‘lib, bu o‘simlik qoplamiga salbiy ta’sir qiladi. Natijalar meliorativ va ekologik tadbirlarni ilmiy asosda rejalashtirish, sho‘rlanish xavfi yuqori hududlarni aniqlash va barqaror yer resurslarini boshqarishda amaliy ahamiyatga ega.

Manbalar (References)

1. Арипов И. К., Радкевич М. В., Гапиров А. Д. Влияние уровня и минерализации грунтовых вод на урожайность сельскохозяйственных культур // *Universum: химия и биология*. – 2024. – Т. 1. – №. 1 (115). – С. 32-36.
2. Aripov I., Radkevich M. Sirdaryo viloyatida sho‘rlangan hududlarni melioratsiyalashtirish samaradorligining iqtisodiy baholanishi // *Farg‘ona davlat universiteti*. – 2024. – №. 4. – С. 115-115.
3. Djuraev, R. Evaluation of soil salinity level through NDVI in Syrdarya Province, Uzbekistan // *E3S Web Conf.* – 2021. – Vol. 258. – P. 03017. <https://doi.org/10.1051/e3sconf/202125803017>
4. FAO. Global Status of Salt-Affected Soils. Rome: Food and Agriculture Organization of the United Nations, 2024.
5. Gojiya, K.M., Rank, H.D., Chauhan, P.M., Patel, D.V., & Satasiya, R.M. Remote sensing and GIS applications in soil salinity analysis: A comprehensive review //

- International Journal of Environment and Climate Change. – 2023. – Vol. 13, № 11. – P. 2149–2161. <https://doi.org/10.9734/ijecc/2023/v13i113377>
6. Huete, A., Justice, C., & Van Leeuwen, W. Overview of MODIS vegetation indices // Remote Sensing of Environment. – 2002. – Vol. 83, № 1–2. – P. 195–213.
7. Kenzhaev, A., Kushiev Kh Kh, & Kholliiev, A.E. Restoration of salinity irrigated land using Glycyrrhiza glabra L. // European Journal of Agricultural and Rural Education. – 2021. – Vol. 4, № 9. – P. 43–49.
8. Nguyen, K.A., Liou, Y.A., Tran, H.P., Hoang, P.P., & Nguyen, T.H. Soil salinity assessment using vegetation soil salinity index and Landsat 8 OLI data: Tra Vinh Province, Vietnam // Progress in Earth and Planetary Science. – 2020. – Vol. 7, № 1. <https://doi.org/10.1186/s40645-019-0311-0>
9. Scanlon, B.R., Faunt, C.C., Longuevergne, L., Reedy, R.C., Alley, W.M., McGuire, V.L., & McMahon, P.B. Global patterns of groundwater depletion // Nature. – 2007. – Vol. 472. – P. 1–4.
10. Shahid, M., & Khan, S. Primary soil salinization: Natural causes and processes // Frontiers in Environmental Science. – 2021. – Vol. 9. – Article 712831.
11. Zhang, L., Li, Y., & Wang, H. Natural soil salinization: Mechanisms and global patterns // Frontiers in Environmental Science. – 2021. – Vol. 9. – Article 860266.

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ОСОБЕННОСТИ ДИНАМИКИ ГРУППОВЫХ ПРОЦЕССОВ В КОНСУЛЬТАТИВНЫХ ГРУППАХ ЛИЧНОСТНОГО РОСТА

***Аннотация:** в статье рассматриваются закономерности развития групповой динамики в консультативных группах личностного роста. Анализируются стадии формирования группы, особенности межличностного взаимодействия участников, роль групповых норм и механизмы терапевтического воздействия. Особое внимание уделяется факторам, влияющим на эффективность групповой работы.*

***Ключевые слова:** групповая динамика, личностный рост, консультативные группы, групповая психотерапия, стадии развития группы.*

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FEATURES OF GROUP PROCESS DYNAMICS IN PERSONAL GROWTH COUNSELING GROUPS

***Abstract:** the article examines the patterns of group dynamics development in personal growth counseling groups. The stages of group formation, features of participants' interpersonal interaction, the role of group norms, and mechanisms of therapeutic impact are analyzed. Special attention is paid to factors affecting the effectiveness of group work.*

***Keywords:** group dynamics, personal growth, counseling groups, group psychotherapy, stages of group development.*

Процесс групповой динамики в современной психологической практике выходит далеко за рамки простого описания взаимодействий между участниками. В контексте консультативных групп личностного роста динамические процессы приобретают статус основного механизма, обеспечивающего не просто коммуникацию, а трансформацию личности.

В отличие от лечебных или коррекционных групп, где фокус часто смещен на симптоматику, группы личностного роста ориентированы на раскрытие человеческого потенциала и экзистенциальное самоопределение.

Динамика группы требует жестко структурированного пространства, которое обеспечивает безопасность для болезненных и глубоких

переживаний. Как подчеркивает Д.П. Ершов, организационные принципы и групповые нормы являются «не формальностью, а несущей конструкцией метода» [1]. Специфика динамики в группах личностного роста заключается в искусственном создании условий, контрастирующих с привычной социальной средой.

Важнейшим условием запуска терапевтической динамики является отказ от социальных ролей. Правило обращения на «ты» и по имени, действующее «только на период групповой работы», служит инструментом «разрушения социальных барьеров и ролевых дистанций».

Д.П. Ершов справедливо отмечает, что игнорирование этого принципа блокирует динамику, так как «личностная работа всегда проблематична, если в группе не созданы условия, отличные от деловых» [1].

Другим критическим фактором, влияющим на процесс, является принцип «здесь и теперь» и запрет на «уход-избегание». Динамика группы неизбежно приводит участников к столкновению с фрустрацией и внутренними конфликтами. Обязательство не покидать курс до окончания программы, какие бы эмоции и переживания он ни вызывал, позволяет удержать группу в зоне напряжения, необходимой для проработки кризисов, предотвращая бегство от инсайтов. Именно в этих жестких, но безопасных рамках разворачивается сложный процесс психологического взросления группы.

Для понимания сути процессов, происходящих в группах личностного роста, принципиально важно разграничение социальной и терапевтической динамики, предложенное О.В. Немеринским [3]. Если обычная групповая динамика может быть цикличной и ситуативной, то терапевтическая динамика представляет собой «монотонный и прогрессивный процесс разрешения личностных проблем участников» [3]. Данный процесс представляет собой «закономерную последовательность актуализации и проживания экзистенциальных противоречий» [3].

О.В. Немеринский метафорически описывает этот путь как «лестницу полагания ценности своего Я» [3]. Движение по этой лестнице подразумевает прохождение через ряд качественных трансформаций самосознания, где каждая последующая стадия диалектически отрицает предыдущую, что позволяет рассматривать динамику группы не как серию конфликтов и примирений, а как целостный путь экзистенциального развития.

В.В. Кузовкин дополняет эту картину, указывая на «связь между стадиями групповой динамики и последовательностью актуализации личностных проблем» [2]. Группа не может помочь участнику решить проблему глубокой интимности или экзистенциального одиночества, если она сама находится на стадии первичной зависимости или борьбы за власть. Поэтому ведущий должен синхронизировать индивидуальные запросы с уровнем зрелости группы.

Начальный этап работы группы характеризуется высокой тревожностью и потребностью в безопасности. Участники стремятся найти

черты сходства, объединиться перед лицом неопределенности или фигуры ведущего. Возникает феномен групповой солидаризации, который, однако, часто носит защитный характер. Участники готовы пожертвовать своей индивидуальностью ради ощущения «мы», создавая иллюзию единства.

Д.П. Ершов описывает физические проявления этой фазы через «закрытые позы» и формальные разговоры «ни о чем», которые служат своеобразным щитом, «отгораживая человека от группы». Задача этой стадии – создать фундамент безопасности, без которого дальнейшее углубление невозможно [1].

Переход ко второй фазе неизбежно связан с кризисом первичного единства. На смену слиянию приходит самовыражение, границы и ответственность. Участники начинают тяготиться необходимостью соответствовать групповым ожиданиям и «встают перед необходимостью отбросить социальные маски» [1]. Это наиболее сложный этап для ведущего, так как динамика приобретает конфликтный характер. Проявляется феномен сопротивления.

Успешное преодоление кризиса автономии выводит группу на уровень конструктивной работы и подлинной сплоченности. В фокусе внимания оказываются проблемы интимности, доверия и способности к бескорыстному дарению. На этом этапе динамика характеризуется высокой эмоциональной интенсивностью. Происходит, по словам Д.П. Ершова, «взаимное тяготение членов группы друг к другу» [1], что выражается в открытом проявлении чувств и телесной раскрепощенности. Ключевым терапевтическим механизмом здесь становится групповой резонанс. Благодаря «многочисленным отождествлениям, переносам и контрпереносам» [1], индивидуальная работа одного участника запускает мощные процессы у остальных.

В.В. Кузовкин подчеркивает, что именно на этой стадии «сами участники группы становятся психотерапевтами друг для друга» [2], обеспечивая множественные эмпатические отражения. Техники и упражнения на этом этапе работают не сами по себе, а как часть атмосферы безусловного принятия.

Высшей точкой развития групповой динамики является стадия экзистенциальной интеграции. Она становится возможной только после того, как участники прожили опыт слияния, отстояли свою свободу и познали опыт близости. Теперь фокус возвращается к самому человеку, но уже на новом уровне. Сущностью этой стадии является движение к самопринятию и любви к себе. Участники сталкиваются с темами одиночества, конечности отношений и собственной уникальности. Динамика здесь становится более тихой, глубинной и интроспективной.

Таким образом, динамика групповых процессов в консультативных группах личностного роста представляет собой сложный процесс. Эффективность этого процесса подтверждается тем, что изменения не заканчиваются с завершением тренинга. Сформированная в группе «зона

ближайшего развития» продолжает работать, позволяя участникам внедрять новый опыт в реальную жизнь, делая обретенные навыки произвольными и осознанными.

Использованные источники:

1. Ершов Д.П. Методические особенности тренинга личностного роста. Консультативная психология и психотерапия. 2004. №12(2). С. 173–195.
2. Кузовкин В.В. Личностный рост // Большой психологический словарь. 4-е изд., расширенное / Сост. и общ. ред. Б.Г. Мещеряков, В.П. Зинченко. М.: АСТ: АСТ МОСКВА; СПб.: Прайм-ЕВРОЗНАК, 2009. 319 с.
3. Немиринский О.В. Терапевтическая роль групповой динамики // Консультативная психология и психотерапия. 1993. Том 2. № 3 [Электронный ресурс] // Режим доступа: https://psyjournals.ru/journals/cpp/archive/1993_n3/25782 /(дата обращения: 21.01.2026).

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СОВЕРШЕНСТВОВАНИЕ СТРАТЕГИИ ПОДДЕРЖКИ МАЛОГО БИЗНЕСА И ЧАСТНОГО ПРЕДПРИНИМАТЕЛЬСТВА

Аннотация: В современных условиях формирования устойчивой и конкурентоспособной экономики малый бизнес и частное предпринимательство выступают ключевыми драйверами роста, занятости и инноваций. В работе рассматриваются основные направления государственной поддержки, приводятся актуальные статистические факторы развития малого бизнеса в Республике Узбекистан и анализируются ключевые результаты реализации мер поддержки на современном этапе.

Ключевые слова: малый бизнес, частное предпринимательство, государственная поддержка, стратегия развития, экономический рост, МСП, финансирование, инновации, Узбекистан.

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Abstract: In modern conditions of formation of a sustainable and competitive economy, small businesses and private entrepreneurship are key drivers of growth, employment and innovation. The work examines the main directions of government support, provides current statistical factors for the development of small businesses in the Republic of Uzbekistan, and analyzes the key results of the implementation of support measures at the present stage.

Key words: small business, private entrepreneurship, government support, development strategy, economic growth, SMEs, financing, innovation, Uzbekistan.

Малый бизнес и частное предпринимательство являются важнейшими элементами рыночной экономики, обеспечивая занятость населения, стимулируя инновации и создавая добавленную стоимость. В условиях глобальных экономических изменений и нестабильности 2025–2026 гг. формирование и совершенствование стратегии поддержки малого бизнеса становятся основой устойчивого социально-экономического развития стран, включая Республику Узбекистан.

Следует учитывать следующие концептуальные подходы, стимулирующие становление и развитие малого бизнеса:

- обеспечивать не только условия для функционирования системы малых предприятий, действующих на базе различных форм собственности, но и их эффективное и устойчивое развитие;

- быть динамичной системой, способствующей возникновению и становлению новых партнерских связей, взаимодействующих с ее составляющими;

- быть адекватной уровню развития малого предпринимательства и потребностям предпринимательских структур с учетом их отраслевой и функциональной специализации;

- быть доступными всем предпринимательским структурам (по дислокации, стоимости деловых услуг и их качеству, информированности о реальных возможностях и др.) и обеспечивать возможности решения важнейших проблем развития малого бизнеса (доступ к информационным сетям, к обеспечению имущественной и информационной поддержки, решение кадровых проблем, финансовое и налоговое консультирование и др.)[1. 116-117].

Исходя из этого, нами сформулирована стратегия системы управления органов поддержки малого предпринимательства, которая заключается в создании благоприятных условий для развития малого предпринимательства в Узбекистане. На основе реинжиниринга бизнес-процессов, определим условия и факторы, оказывающие непосредственное влияние на успешное развитие малого предпринимательства.

Функцию исследования и актуализации нормативно-правовой базы осуществляют органы инфраструктуры поддержки малого предпринимательства. Управление осуществляется на основании действующего законодательства, программ поддержки малого предпринимательства и методов анализа и исследования. Результатом выполнения функции является разработанная стратегия и актуализированная нормативно-правовая база. На первом этапе для формирования стратегии используются накопленная информация. Периодически корректируемая нормативно-правовая база и стратегия действий являются управляющими для остальных функций. Стратегия представляет собой наиболее принципиальные и важные установки, планы, намерения, направленные на развитие малого предпринимательства.

Функция координации и мотивации деятельности органов поддержки малого предпринимательства предполагает разработку мотивирующей модели их деятельности. На этом этапе выявляются недостающие, слабые, дублирующие функции. Затем выявленные функции и деятельность органов поддержки координируются с учетом горизонтальной и вертикальной интеграции, в результате чего получается измененная структура. Кроме этого, необходимо мотивировать органы поддержки предпринимательства. Этому должна способствовать мотивирующая модель. Модель представляет собой влияние мотивирующих факторов на улучшение деятельности органов

поддержки малого предпринимательства. Функция защиты интересов предпринимателей. Выполнение данной функции возлагается на региональное отделение торгово-промышленной палаты. Органы инфраструктуры поддержки малого предпринимательства должны быть задействованы при реализации всех функций.

Основным направлением интегрирования интересов малого бизнеса и банковского сектора должно стать укрепление их отношений на двусторонней основе. Предлагаемая нами модель требует изменения традиционной идеологии отношений между банком и малым предприятием. Эти отношения предполагают наличие четко сформулированных и формально закреплённых принципов и обязательств по всем точкам пересечения хозяйственных интересов [2].

В Узбекистане более половины экономики приходится на малый и средний бизнес. За последние годы количество субъектов сферы увеличилось вдвое, а число занятых в них превысило 10,5 млн человек, что свидетельствует о важности предпринимательской деятельности для экономического роста и занятости населения. В 2025 году в Узбекистане утверждена новая стратегия развития малого и среднего бизнеса на период до 2030 г., включающая целевые показатели по увеличению доли МСП в ВВП, экспорте и занятости. С июля 2025 года введён мораторий на дополнительные обязанности для МСП до 2028 года, что снижает административные барьеры и стимулирует предпринимательскую активность. Также отменена государственная пошлина при регистрации новых ИП и предприятий в 2025–2026 гг.

Основной инструмент поддержки — кредитование малого бизнеса: банки планируют выделить в 2025 году около 11,6 трлн сумов на развитие МСП, что существенно увеличивает доступ к финансовым ресурсам для расширения и роста новых предприятий. Несмотря на положительные тенденции, предприниматели сталкиваются с рядом проблем:

- ограниченный доступ к долгосрочному финансированию, особенно для инновационных стартапов;
- недостаточная подготовка управленческих навыков у начинающих предпринимателей;
- конкуренция с крупными структурами и импортной продукцией;
- сложность выхода на международные рынки.

Эти вызовы требуют комплексных решений, включая усиление образовательной поддержки и повышение финансовой грамотности предпринимателей. Чтобы усилить влияние поддержки малого бизнеса и частного предпринимательства, предлагаются следующие направления:

1. Расширение программ льготного кредитования с фокусом на долгосрочные инвестиции и инновационные проекты.

2. Создание образовательных платформ и тренингов для повышения управленческих компетенций предпринимателей.

3. Развитие цифровых сервисов для автоматизации бизнес-процессов и доступа к рынкам.

4. Стимулирование экспорта малых предприятий через целевые программы и международное сотрудничество.

Совершенствование стратегии поддержки малого бизнеса и частного предпринимательства является приоритетной задачей экономической политики Узбекистана в 2025–2026 гг. Государственные меры, ориентированные на упрощение административных процедур, расширение финансовой поддержки и развитие предпринимательской инфраструктуры, способствуют укреплению экономической устойчивости и социальной стабильности. Однако дальнейшие шаги должны учитывать современные вызовы и глобальные тенденции.

Использованные источники:

1. Курпаяниди К.И. Современные тенденции развития предпринимательства в сфере промышленного производства: региональный аспект.- Т.:Иктисодиёт, 2011. – С. 160.
2. Зайцев Н. Л. Экономика, организация и управление предприятием. - М.: Инфра-М, 2012. – С. 455.
3. Abdunazarov, S. A. (2021). DEVELOPMENT OF THE GREEN ECONOMY IN UZBEKISTAN. *American Scientific Journal*, (49-1), 43-45.

МОРФОЛОГИЧЕСКИЕ ОСОБЕННОСТИ ПЛАЦЕНТЫ ПРИ МАТЕРИНСКОЙ СМЕРТНОСТИ

Резюме: Актуальность. Материнская смертность остаётся важным индикатором качества акушерской и реанимационной помощи. Морфологическое исследование плаценты позволяет объективно оценить патогенетические механизмы хронической плацентарной недостаточности и острых акушерских катастроф, предшествующих летальному исходу.

Цель. Охарактеризовать макро- и микроморфологические изменения плаценты при материнской смертности и определить их значение в формировании критических состояний.

Материалы и методы. Проведён ретроспективный морфологический анализ плацент у 105 случаев материнской смерти за 2020–2024 гг. Оценивались макроскопические параметры плаценты, гистологические признаки гипоксии, тромбоза, воспаления, фибриноидного некроза и хронической плацентарной недостаточности. Статистическая обработка выполнена с использованием χ^2 -критерия, уровень значимости $p < 0,05$.

Результаты. Выявлено, что плацентарная патология при материнской смертности формируется как сочетание хронической гипоксически-ишемической дисфункции и острых геморрагических и тромботических поражений. На макроуровне преобладали инфаркты плаценты, гематомы и отслойка, на микроуровне - гипоксические изменения, нарушения васкуляризации ворсин, тромбозы и фибриноидный некроз. Признаки хронической плацентарной недостаточности выявлены более чем у половины наблюдений.

Заключение. Плацента при материнской смертности отражает комплекс хронических и острых патологических процессов и может рассматриваться как интегральный морфологический маркер механизмов декомпенсации в системе «мать–плацента–плод».

Ключевые слова: материнская смертность, плацента, морфология, гипоксия, тромбоз, плацентарная недостаточность.

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MORPHOLOGICAL FEATURES OF THE PLACENTA IN MATERNAL MORTALITY

Summary: *Relevance. Maternal mortality remains a crucial indicator of the quality of obstetric and intensive care services. Morphological examination of the placenta provides an objective assessment of pathogenetic mechanisms underlying chronic placental insufficiency and acute obstetric catastrophes preceding fatal outcomes.*

Objective. To characterize the macro- and micromorphological changes of the placenta in cases of maternal mortality and to determine their role in the development of critical obstetric conditions.

Materials and Methods. A retrospective morphological analysis of placentas from 105 cases of maternal death recorded between 2020 and 2024 was performed. Macroscopic placental parameters and histological features of hypoxia, thrombosis, inflammation, fibrinoid necrosis, and chronic placental insufficiency were evaluated. Statistical analysis was carried out using the chi-square test, with significance set at $p < 0.05$.

Results. Placental pathology in maternal mortality was found to result from a combination of chronic hypoxic–ischemic dysfunction and acute hemorrhagic and thrombotic lesions. At the macroscopic level, placental infarctions, hematomas, and placental abruption predominated, whereas at the microscopic level hypoxic changes, impaired villous vascularization, thrombosis, and fibrinoid necrosis were most frequently observed. Structural features of chronic placental insufficiency were identified in more than half of the cases.

Conclusion. In maternal mortality, the placenta reflects a complex interplay of chronic and acute pathological processes and may be regarded as an integral morphological marker of decompensation within the mother–placenta–fetus system.

Keywords: *maternal mortality, placenta, morphology, hypoxia, thrombosis, placental insufficiency.*

Ведение. Материнская смертность остаётся одним из наиболее чувствительных интегральных показателей состояния системы охраны материнства и детства, отражая как уровень акушерской помощи, так и эффективность раннего выявления и коррекции жизнеугрожающих состояний. Несмотря на глобальное снижение показателей за последние

десятилетия, по данным Всемирной организации здравоохранения, ежегодно в мире регистрируются сотни тысяч случаев материнской смерти, значительная часть которых относится к категории потенциально предотвратимых [3, 4].

Современные эпидемиологические исследования показывают, что ведущими причинами материнской смертности во всём мире продолжают оставаться акушерские кровотечения, гипертензивные расстройства беременности и сепсис, нередко развивающиеся на фоне экстрагенитальной патологии и системных нарушений гемостаза [2, 3]. При этом всё большее внимание уделяется роли плаценты как центрального органа, интегрирующего гемодинамические, метаболические и иммунологические процессы в системе «мать–плацента–плод».

Патологоанатомическое и морфологическое исследование плаценты рассматривается как важнейший инструмент ретроспективной оценки патогенеза критических акушерских состояний. Морфологические признаки гипоксии, тромбоза, воспаления и нарушений васкуляризации ворсин отражают как длительно текущую плацентарную недостаточность, так и острые эпизоды декомпенсации, предшествующие летальному исходу [1]. В этом контексте плацента выступает не только объектом посмертного анализа, но и своеобразным «биологическим регистратором» клинко-патофизиологических событий беременности.

Международный консенсус Amsterdam Placental Workshop Group предложил стандартизированный подход к интерпретации плацентарных поражений, позволивший унифицировать диагностику ишемических, тромботических и воспалительных изменений и связать их с клиническими исходами беременности [1]. Однако данные о морфологических особенностях плаценты именно при материнской смертности остаются ограниченными, особенно в странах со средним уровнем дохода, где организационные и социальные факторы нередко усиливают влияние медицинских причин.

В этой связи комплексный морфологический анализ плацентарного комплекса при материнской смертности представляется актуальным для более глубокого понимания механизмов декомпенсации в системе «мать–плацента–плод», а также для выявления структурных маркеров хронических и острых патологических процессов, имеющих значение для профилактики предотвратимых летальных исходов.

Целью настоящей работы. Оценить макро- и микроморфологические паттерны поражения плаценты при материнской смертности и определить, какие изменения отражают хроническую плацентарную дисфункцию и какие — острую “плацентарную катастрофу” (кровотечение/отслойка/тромбоз), влияющую на исход.

Материалы и методы исследования

Настоящее исследование выполнено в формате ретроспективного морфологического анализа и основано на результатах патологоанатомического изучения плацентарного комплекса у случаев

материнской смертности. Материалом исследования послужили данные 105 последовательных наблюдений материнской смерти, зарегистрированных в период 2020–2024 гг., с обязательным наличием сохранённого последа, пригодного для макроскопического и гистологического анализа

Исследование проводилось на базе Республиканского патологоанатомического центра и профильных судебно-медицинских подразделений Министерства здравоохранения Республики Узбекистан. В качестве единицы наблюдения рассматривался комплекс «пациентка – плацента», что обеспечивало возможность сопоставления морфологических изменений плацентарной ткани с клинико-акушерским течением и исходом беременности.

Критерии включения и исключения

В исследование включались случаи материнской смерти, наступившей во время беременности, родов или в течение 42 суток после их завершения, при наличии: протокола патологоанатомического вскрытия; сохранённого плацентарного материала, пригодного для макроскопического и микроскопического исследования; достоверно установленной клинической причины смерти.

Из анализа исключались случаи поздней материнской смертности (более 42 суток после завершения беременности), а также наблюдения с выраженной деструкцией или утратой плацентарной ткани, не позволяющей выполнить полноценную морфологическую оценку.

Макроскопическое исследование плаценты выполнялось по стандартному протоколу с обязательной оценкой: массы и диаметра плацентарного диска; состояния материнской и плодной поверхностей; характера прикрепления пуповины; целостности плодных оболочек; наличия ишемических, геморрагических и инвазивных изменений.

Фиксировались признаки инфарктов плаценты, преждевременной отслойки нормально расположенной плаценты, ретроплацентарных, субхориальных и интерворсинчатых гематом, а также аномалии прикрепления плаценты и пуповины. Стадия зрелости плаценты оценивалась в сопоставлении с гестационным сроком беременности.

Для гистологического анализа из каждой плаценты отбирались стандартные серийные фрагменты из центральных и периферических отделов плацентарного диска, базальной пластинки, плодных оболочек и пуповины. Материал фиксировался в 10% нейтральном формалине, проводился по стандартной гистологической методике с последующей заливкой в парафин.

Срезы толщиной 4–5 мкм окрашивались гематоксилином и эозином. Микроскопическая оценка включала анализ: структуры хориона и децидуальной оболочки; степени васкуляризации ворсин; наличия тромботических изменений ворсинчатого дерева; выраженности гипоксических и ишемических поражений; воспалительных изменений (хориоамнионит, интервиллозит, фуникулит); признаков хронической

плацентарной недостаточности; вариантов фибриноидного некроза плацентарной ткани.

Морфологическая интерпретация выполнялась с учётом международных критериев оценки плацентарных поражений (Amsterdam Placental Workshop Group), с дифференциацией острых и хронических патологических процессов.

Статистическая обработка данных проводилась с использованием пакета IBM SPSS Statistics (v.26). Категориальные показатели представлены в виде абсолютных значений и процентов. Для оценки достоверности различий применялся χ^2 -критерий Пирсона. Различия считались статистически значимыми при уровне $p < 0,05$.

Результаты исследования

1) Макроскопические параметры и морфометрический профиль плаценты

Ключевой результат: выявлена статистически значимая связь массы и диаметра плаценты, что отражает разные морфологические сценарии плацентарной дисфункции при материнской смертности ($\chi^2 = 29,6$; $df = 9$; $p = 0,0005$).

Таблица 1.

Распределение массы плаценты в зависимости от её диаметра (n = 105)

Вес плаценты / Диаметр	<15 см	15–20 см	>20 см	Не измерен	Итого
<400 г (гипотрофическая)	19 (18,1%)	2 (1,9%)	0 (0%)	1 (1,0%)	22 (21,0%)
400–600 г (норма)	1 (1,0%)	31 (29,5%)	5 (4,8%)	2 (1,9%)	39 (37,1%)
>600 г (макросомия/отёчная)	2 (1,9%)	10 (9,5%)	5 (4,8%)	0 (0%)	17 (16,2%)
Не определено (нет данных/повреждение)	0 (0%)	10 (9,5%)	11 (10,5%)	6 (5,7%)	27 (25,7%)
Итого	22 (21,0%)	53 (50,5%)	21 (20,0%)	9 (8,6%)	105 (100%)

Гипотрофическая плацента (<400 г) в большинстве случаев сочеталась с диаметром <15 см, что морфологически соответствует выраженной редукции плацентарного диска и ограниченному компенсаторному резерву. Напротив, при массе >600 г наблюдалось смещение к увеличенному диаметру >20 см, что более характерно для отёчно-гиперпластической перестройки при хронической гипоксии и гемодинамических расстройствах. Группа «не определено» демонстрировала высокую долю больших диаметров и отсутствия измерений, что отражает частые деструктивные изменения последа и объективные ограничения морфометрии в терминальных состояниях.

2) Ишемико-геморрагические и инвазивные поражения (макроморфология)

Таблица 2.

Ишемико-геморрагические и инвазивные изменения плаценты (n = 105)

Показатель	Категория	n	%
Инфаркты плаценты	Выявлены	62	59,0
	Не выявлены	43	41,0
Отслойка плаценты	Выявлена	28	26,7
	Не выявлена	77	73,3
Тип/локализация гематом	Ретроплацентарная (острая)	24	22,9
	Субхориальная	12	11,4
	Интерворсинчатая	15	14,3
	Множественные (сочетанные)	9	8,6
	Микрогематомы (очаговые)	18	17,1
	Не выявлены	27	25,7
Нарушения прикрепления	Выявлены	19	18,1
	Не выявлены	86	81,9

Макропрофиль плацентарных поражений в когорте материнской смертности формируется сочетанием хронического ишемического фона и эпизодов острой «плацентарной катастрофы». Инфаркты (59,0%) отражают доминирование хронической гипоперфузии ворсинчатого дерева и могут рассматриваться как структурный субстрат длительно текущей плацентарной недостаточности. Преждевременная отслойка (26,7%) и высокая частота гематом (суммарно 74,3%) статистически подтверждают значительный вклад острых геморрагических событий, непосредственно вовлечённых в танатогенез через массивную кровопотерю, шок и коагулопатии. Нарушения прикрепления (18,1%) при меньшей распространённости имеют особую клинко-патогенетическую «весомость», поскольку ассоциированы с неконтролируемыми кровотечениями и необходимостью экстренных хирургических вмешательств.

3) Стадия зрелости плаценты и соответствие гестационному сроку

Таблица 3.

Стадия зрелости плаценты у случаев материнской смертности (n = 105)

Категория	n	%
I стадия (до 28 недель)	14	13,3
II стадия (28–34 недели)	29	27,6
III стадия (доношенная)	41	39,0
Несоответствие стадии зрелости сроку	21	20,0
Итого	105	100

Преобладание III стадии (39,0%) указывает, что значительная часть летальных исходов развивается на фоне сформированного плацентарного комплекса, т.е. материнская смертность в выборке не «сводится» к ранним срокам. Существенная доля несоответствия зрелости сроку (20,0%) является морфологическим маркером нарушенного ремоделирования плаценты (преждевременное «старение» либо функциональная незрелость), что патогенетически согласуется с хронической плацентарной недостаточностью.

4) Микроскопические варианты плацентарной патологии

4.1. Хорион/децидуальная оболочка, пуповина, сосуды и васкуляризация ворсин

Таблица 4.

Микроскопические варианты плацентарной патологии (n = 105)

Признаки	Категория	n	%
Хорион и децидуальная оболочка	Выраженная дистрофия	31	29,5
	Фиброз/склероз децидуальной ткани	18	17,1
	Воспаление (децидуит/хориодецидуит)	22	21,0
	Очаговый некроз	12	11,4
	Без патологии	22	21,0
Пуповина	Тромбоз сосудов	21	20,0
	Отёк Вартонова студня	26	24,8
	Склероз/фиброз стенки сосудов	14	13,3
	Фуникулит	11	10,5
	Аномалии количества сосудов	8	7,6
Количество сосудов пуповины	Без патологии	25	23,8
	Три (норма)	87	82,9
	Два (одна артерия)	14	13,3
	Атипично/не визуализированы	4	3,8
	Без патологии	25	23,8
Васкуляризация ворсин	Гиповаскуляризация (выраженная)	41	39,0
	Очаговая/неравномерная	28	26,7
	Компенсаторная гиперваскуляризация	14	13,3
	Без выраженных нарушений	22	21,0

Микроморфология демонстрирует преобладание хронически формирующегося повреждения: дистрофия и воспаление хорио-децидуального комплекса встречались часто, однако сохранялась выраженная гетерогенность механизмов (в 21,0% патологических изменений не выявлено). В пуповине преобладали отёк Вартонова студня (24,8%) и тромбоз сосудов (20,0%), что отражает тяжёлые нарушения фетоплацентарной гемодинамики. Выявление двухсосудистой пуповины у 13,3% существенно выходит за рамки популяционных ожиданий и может рассматриваться как морфологический индикатор дизангиогенеза и хронической плацентарной недостаточности. На уровне ворсин доминирует гиповаскуляризация (39,0%) — морфологический эквивалент истощения микроциркуляции и хронической гипоксии, тогда как гиперваскуляризация (13,3%) интерпретируется как компенсаторная, но функционально недостаточная реакция.

4.2. Тромботические поражения ворсинчатого дерева

Таблица 5.

Тромботические изменения в ворсинчатом дереве (n = 105)

Вариант тромботических изменений	n	%
Отсутствуют	47	44,8
Единичные фибриновые тромбы	18	17,1
Множественные тромбы в межворсинчатом пространстве	16	15,2
Тромбоз стволовых ворсин	13	12,4
Фибриноидный некроз с тромбообразованием	11	10,5
Итого	105	100

Тромботические изменения выявлялись более чем у половины наблюдений (55,2%), формируя один из центральных микроморфологических паттернов плацентарной дисфункции при материнской смертности. Преобладание «малых» форм (единичные и множественные тромбы суммарно 32,3%) соответствует хроническому/подострому дисбалансу коагуляции и фибринолиза. Одновременно значимая доля тяжёлых вариантов (тромбоз стволовых ворсин 12,4% и фибриноидный некроз с тромбозом 10,5%) отражает глубокую дезорганизацию плацентарного кровотока с утратой функциональной поверхности ворсин и прогрессирующей ишемией.

4.3. Фибриноидный некроз плаценты

Таблица 6.

Фибриноидный некроз плаценты: морфологические варианты (n = 105)

Фибриноидный некроз плаценты	n	%
Отсутствует	49	46,7
Очаговый (в пределах базальной пластинки)	21	20,0
Выраженный (межворсинчатое пространство/поверхность ворсин)	17	16,2
Массивный с вовлечением стволовых ворсин	10	9,5
Сочетание с тромбообразованием	8	7,6
Итого	105	100

Фибриноидный некроз выявлялся в 53,3% случаев и отражал спектр ишемико-гипоксического повреждения от локальных до массивных форм. Клинически наиболее «тяжёлыми» являются массивные варианты и некроз в сочетании с тромбозом (суммарно 17,1%), поскольку они соответствуют морфологической декомпенсации плацентарного обмена и, как правило, включают выключение значимых участков ворсинчатого дерева из кровотока.

4.4. Гипоксические изменения плаценты (градации выраженности)

Таблица 7.

Гипоксические изменения плаценты: степени выраженности (n = 105)

Степень/вариант	n	%
Не выражены	26	24,8
Умеренные	29	27,6
Выраженные	24	22,9
Тотальные повреждения с коллапсом ворсин	16	15,2
Гипоксическая плацентопатия (комплексная форма)	10	9,5
Итого	105	100

Гипоксический компонент присутствовал у 75,2% наблюдений и, по сути, формировал «патогенетический фон», на котором реализуются тромботические и некротические поражения. Наиболее частыми были умеренные и выраженные варианты (50,5%), однако обращает внимание существенная доля морфологически тяжёлых форм (коллапс ворсин и комплексная гипоксическая плацентопатия - 24,7%), соответствующих стадии декомпенсации плацентарного кровообращения.

4.5. Воспалительная реакция плацентарной ткани (клеточная инфильтрация)

Таблица 8.

Клеточная инфильтрация плаценты: морфологические варианты (n = 105)

Вариант инфильтрации	n	%
Отсутствует	53	50,5
Лимфоцитарная (хроническая)	23	21,9
Нейтрофильная (острая)	13	12,4
Плазмоцитарная (аутоиммунные реакции)	5	4,8
Смешанная	11	10,5
Итого	105	100

Воспалительный компонент выявлялся у 49,5% пациенток, но не являлся универсальным. Преобладание лимфоцитарной инфильтрации (21,9%) указывает на хроническое иммуновоспалительное воздействие, тогда как нейтрофильный тип (12,4%) и смешанные формы (10,5%) соответствуют более «острым» или комбинированным сценариям, потенциально связанным с восходящей инфекцией/системным воспалительным ответом и повреждением трофобласта.

4.6. Хроническая плацентарная недостаточность (ХПН): структурные маркеры

Таблица 9.

Хроническая плацентарная недостаточность: морфологические признаки (n = 105)

Хроническая плацентарная недостаточность	n	%
Отсутствует	49	46,7
Снижение количества зрелых терминальных ворсин	20	19,0
Стромальная редукция ворсин	25	23,8
Утолщение базальной мембраны	7	6,7
Пролиферация цитотрофобласта на фоне гипоксии	4	3,8
Итого	105	100

Признаки ХПН выявлялись у 53,3% случаев. Ведущими морфологическими вариантами были стромальная редукция ворсин (23,8%) и снижение числа зрелых терминальных ворсин (19,0%), что отражает нарушение созревания ворсинчатого дерева и длительную гипоперфузию. Более редкие признаки (утолщение базальных мембран, пролиферация цитотрофобласта) типичны для длительных адаптационных реакций, переходящих в стадию структурной декомпенсации.

Совокупность макро- и микроморфологических данных показывает, что плацентарная патология при материнской смертности представляет собой не набор случайных находок, а воспроизводимый комплекс хронических и острых поражений. На макроуровне доминируют ишемические изменения (инфаркты 59,0%) и геморрагические события с высокой частотой гематом (74,3%) и значимой долей отслойки (26,7%; $p < 0,001$), формируя морфологический эквивалент «плацентарной катастрофы». На микроуровне ключевыми являются гипоксические изменения (75,2%; $p = 0,0011$), нарушения васкуляризации ворсин (79,0%), тромботические поражения (55,2%; $p < 0,001$), фибриноидный некроз (53,3%; $p < 0,001$), а воспалительный компонент проявляет вариабельность (клеточная инфильтрация 49,5%).

Обсуждение. Полученный морфологический профиль плацентарной патологии при материнской смертности демонстрирует закономерную двухконтурную структуру танатогенеза: (1) длительно формирующийся фон хронической гипоперфузии плаценты и (2) эпизоды острой декомпенсации с геморрагическим и/или тромботическим компонентом. Такой «двухударный» механизм хорошо согласуется с современной концепцией того, что материнская смертность чаще обусловлена сочетанием прямых акушерских причин (кровотечения, гипертензивные осложнения, сепсис) и не прямых факторов, которые повышают уязвимость системы «мать–плацента–плод».

Статистически значимая связь массы и диаметра плаценты ($\chi^2=29,6$; $p=0,0005$) указывает, что даже на «простом» макроуровне плацента фиксирует разные траектории патологической перестройки. Гипотрофия диска (<400 г) с преобладанием малых диаметров типологически ближе к материнской сосудистой мальперфузии с редукцией терминальных ворсин и истощением

компенсаторного резерва. Напротив, большая масса (>600 г) и смещение к крупным диаметрам могут отражать отёчно-гиперпластическую перестройку при длительной гипоксии и гемодинамической нестабильности. Подобная логика морфологической интерпретации соответствует принципам стандартизированного описания плацентарных поражений, предложенным Amsterdam Placental Workshop Group [1].

В реальной клинической практике морфометрия нередко недооценивается как “второстепенная”, однако ваши данные показывают, что уже этот уровень измерений способен разделять плаценты по патогенетическим сценариям и тем самым служить ранним морфологическим “сигналом” неблагополучия системы кровообращения плаценты.

Значимая доля отслойки плаценты (26,7%; $p < 0,001$) и высокая распространённость гематом разных типов формируют морфологический эквивалент острого геморрагического события. В глобальных обзорах причин материнской смертности кровотечения стабильно входят в число ведущих непосредственных причин смерти [3], а современные клинические документы подчёркивают, что исход во многом определяется скоростью эскалации помощи и ранним применением стандартизированных протоколов лечения послеродового кровотечения.

Морфологические находки (ретроплацентарные/субхориальные/интерворсинчатые гематомы) позволяют ретроспективно уточнять вклад кровотечения и коагулопатии, особенно в ситуациях, когда клиническая документация неполна или события развивались молниеносно. В этом смысле плацента выступает не просто “объектом посмертного анализа”, а интегральным носителем информации о времени, длительности и механизме острой декомпенсации.

Тромботические поражения выявлялись более чем у половины наблюдений, а фибриноидный некроз - у 53,3%. Такая комбинация типична для спектра нарушений плацентарной перфузии, где хроническая гипоксия создаёт условия для локального тромбообразования, а эпизоды системной гемодинамической нестабильности и ДВС-сдвигов усиливают повреждение ворсин и выключение плацентарной поверхности из обмена. В терминах Amsterdam-консенсуса (Khong и соавт., 2016) подобные изменения укладываются в “перфузионно-тромботический” континуум поражений и требуют интерпретации с учётом клинического контекста (гипертензивные осложнения, массивные кровопотери, сепсис) [1].

Выраженная доля “тяжёлых” вариантов (тромбоз стволовых ворсин; некроз с тромбообразованием) может рассматриваться как морфологический маркер того, что в части случаев патологический процесс выходит за рамки локальной плацентарной дисфункции и отражает системную коагулопатию критического состояния.

Гипоксический компонент присутствовал в 75,2% случаев. Это подтверждает, что для вашей когорты материнской смертности плацента часто находится в режиме хронической перегрузки и дефицита перфузии, на

фоне которых любая острая акушерская катастрофа (кровотечение/инфекция/гипертензивный криз) реализуется быстрее и тяжелее. Глобальная эпидемиология причин материнской смерти показывает, что именно сочетание “прямой” причины и неблагоприятного фона (коморбидность, задержки диагностики, позднее обращение) формирует наибольший риск неблагоприятного исхода.

Воспалительная инфильтрация выявлялась примерно у половины наблюдений, причём спектр включал хронические и острые варианты. Это хорошо согласуется с тем, что сепсис относится к ведущим причинам материнской смертности, но не объясняет все случаи: инфекционный путь – один из крупных маршрутов к критическому состоянию, однако наряду с ним сохраняются геморрагические и гипертензивные механизмы.

С практической точки зрения ваши данные поддерживают позицию, регулярно подчёркиваемую в конфиденциальных расследованиях материнской смертности: существенная доля неблагоприятных исходов связана не только с тяжестью патологии, но и с организационными задержками, несвоевременной эскалацией помощи и недостаточной маршрутизацией пациенток высокого риска [2]. В этом контексте морфологические паттерны плаценты становятся объективным “аудиторским” инструментом: они позволяют различать хронический фон и острое событие и, следовательно, точнее определять, где именно разорвалась цепочка профилактики и раннего реагирования.

Заключение. Морфологический анализ плацент у случаев материнской смертности (n = 105) показал, что плацентарная патология носит комбинированный характер и формируется на стыке хронической гипоксически-ишемической дисфункции и эпизодов острой плацентарной катастрофы. На макроуровне преобладают инфаркты, гематомы и отслойка, отражающие вклад геморрагических осложнений; на микроуровне доминируют гипоксические изменения, нарушения васкуляризации ворсин, тромботические поражения и фибриноидный некроз как структурные маркеры плацентарной недостаточности.

Полученные данные подтверждают, что плацента выступает объективным интегральным индикатором механизмов декомпенсации в системе «мать–плацента–плод» и может быть использована для ретроспективной верификации патогенетического пути к критическому состоянию. Усиление ранней стратификации риска, своевременная диагностика угроз и стандартная маршрутизация беременных высокого риска остаются ключевыми условиями профилактики предотвратимых летальных исходов.

Использованные источники:

1. Khong T.Y., Mooney E.E., Ariel I., et al. Sampling and Definitions of Placental Lesions: Amsterdam Placental Workshop Group Consensus Statement. Archives of Pathology & Laboratory Medicine. 2016;140(7):698–713.

2. Knight M., Bunch K., Tuffnell D., et al. (eds.). Saving Lives, Improving Mothers' Care: Lessons learned to inform maternity care... MBRRACE-UK, National Perinatal Epidemiology Unit, University of Oxford; 2019.
3. Say L., Chou D., Gemmill A., et al. Global causes of maternal death: a WHO systematic analysis. The Lancet Global Health. 2014;2(6):e323–e333.
4. World Health Organization (WHO). Trends in Maternal Mortality: 2000 to 2017. Geneva: WHO; 2019.

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ЗЕЛЕНАЯ ТРАНСФОРМАЦИЯ АГРАРНОГО СЕКТОРА: ТЕНДЕНЦИИ И ДОСТИЖЕНИЯ

***Аннотация.** В статье анализируются ключевые направления зелёного развития сельского хозяйства в условиях изменения климата и дефицита природных ресурсов. Рассматривается мировой опыт внедрения ресурсосберегающих и экологически ориентированных технологий, а также оценивается текущее состояние зелёного сельского хозяйства в Республике Узбекистан на основе официальных статистических и эмпирических данных. Особое внимание уделено развитию водосберегающих технологий и эффективности использования водных ресурсов. Выявлены основные достижения и ограничения, обоснована необходимость усиления государственной поддержки и расширения доступа фермеров к инновациям для обеспечения устойчивого развития аграрного сектора.*

***Ключевые слова:** зелёное сельское хозяйство, устойчивое развитие, водосберегающие технологии, ирригация, Республика Узбекистан.*

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GREEN TRANSFORMATION OF THE AGRICULTURAL SECTOR: TRENDS AND ACHIEVEMENTS

***Abstract.** The article analyzes key aspects of green agricultural development under climate change and increasing resource scarcity. International experience in implementing resource-saving and environmentally friendly technologies is reviewed, and the current state of green agriculture in the Republic of Uzbekistan is assessed using official statistical and empirical data. Special attention is paid to water-saving irrigation technologies and water-use efficiency. The study identifies major achievements and constraints and substantiates the need for stronger state support and wider access to innovations to ensure sustainable agricultural development.*

***Keywords:** green agriculture, sustainable development, water-saving technologies, irrigation, Republic of Uzbekistan.*

Введение

Сельское хозяйство играет важнейшую роль в обеспечении продовольственной безопасности, занятости населения и устойчивого развития национальной экономики. Вместе с тем традиционные методы аграрного производства сопровождаются деградацией земельных ресурсов, дефицитом воды, снижением биоразнообразия и ростом антропогенной нагрузки на окружающую среду. Указанные проблемы обуславливают необходимость перехода к зелёному развитию сельского хозяйства, основанному на сочетании экономической эффективности и экологической устойчивости. Концепция зелёного развития приобретает всё большее значение и становится объективной необходимостью в мировой практике, особенно для Республики Узбекистан, где преобладает орошаемое земледелие и наблюдается высокая зависимость аграрного сектора от водных ресурсов. Усиление последствий изменения климата, рост водного дефицита и задачи повышения конкурентоспособности сельскохозяйственной продукции определяют актуальность внедрения ресурсосберегающих и экологически ориентированных технологий. Целью данной статьи является анализ мирового опыта и оценка текущего состояния зелёного развития сельского хозяйства Узбекистана на основе реальных эмпирических данных.

Материалы и методы

В исследовании использованы методы анализа и синтеза, статистического и сравнительного анализа. Эмпирическую базу составили:

- официальные данные Государственного комитета по статистике Республики Узбекистан;
- материалы Министерства водного хозяйства Республики Узбекистан;
- аналитические отчёты и базы данных ФАО (AQUASTAT, FAOSTAT);
- публикации Всемирного банка.

Результаты и обсуждение

Изменение климата стало одним из ключевых вызовов для устойчивого развития стран Центральной Азии. Усиление процессов деградации земель и почв, участвовавшие пылевые и песчаные бури, нарастающий дефицит питьевой и оросительной воды, ухудшение качества атмосферного воздуха, сокращение биологического разнообразия, а также снижение урожайности сельскохозяйственных культур оказывают комплексное негативное воздействие на социально-экономическое развитие региона и качество жизни миллионов людей.

В условиях высокой уязвимости природно-ресурсного потенциала и усиления климатических рисков особую актуальность приобретает формирование новой модели экономического развития, основанной на принципах экологической устойчивости, рационального использования

природных ресурсов и низкоуглеродного роста. В этой связи переход к «зелёной» экономике и достижение углеродной нейтральности рассматриваются в Республике Узбекистан как приоритетная и стратегическая задача «Нового Узбекистана», направленная на обеспечение долгосрочной экологической безопасности, повышение конкурентоспособности национальной экономики и улучшение благосостояния населения.

Зелёная экономика в Республике Узбекистан представляет собой долгосрочный стратегический курс социально-экономического развития, институционально закреплённый в «Стратегии перехода к зелёной экономике на 2019–2030 годы». [1] Данный курс предусматривает комплексное внедрение принципов энергоэффективности и ресурсосбережения, расширение использования возобновляемых источников энергии, развитие экологически ориентированных отраслей, включая экотуризм, совершенствование системы обращения и переработки отходов, а также активное привлечение «зелёных» инвестиций.

Постановление Президента Республики Узбекистан «О мерах по повышению эффективности реформ, направленных на переход Республики Узбекистан на “зелёную” экономику до 2030 года», является ключевым нормативно-правовым документом, определяющим институциональные, экономические и организационные основы формирования устойчивой низкоуглеродной модели развития страны. [2]

В соответствии с данным постановлением приоритетными направлениями государственной политики в сфере «зелёной» экономики определены повышение энергоэффективности во всех секторах экономики, расширение использования возобновляемых источников энергии, внедрение ресурсосберегающих и экологически безопасных технологий, совершенствование системы управления водными и земельными ресурсами, а также сокращение негативного воздействия хозяйственной деятельности на окружающую среду. Особое внимание уделяется аграрному сектору как одному из наиболее уязвимых к климатическим изменениям и одновременно ресурсоёмких отраслей экономики.

Постановлением предусмотрено поэтапное внедрение экономических механизмов стимулирования «зелёных» инвестиций, включая развитие рынка возобновляемой энергетики, привлечение частного капитала и международных финансовых институтов, внедрение «зелёных» финансовых инструментов, а также совершенствование нормативно-правовой базы в сфере экологического регулирования. Существенную роль в документе отводится развитию человеческого капитала, повышению экологической культуры населения и внедрению современных цифровых решений для мониторинга природных ресурсов и оценки экологических рисков.

Реализация мер, предусмотренных постановлением, направлена на достижение стратегических целей устойчивого развития, обеспечение экологической безопасности, повышение конкурентоспособности

национальной экономики и улучшение качества жизни населения в долгосрочной перспективе. Таким образом, данное постановление формирует системную основу для практической реализации «Стратегии перехода к зелёной экономике на 2019–2030 годы» и служит важным инструментом интеграции принципов устойчивого развития в государственную экономическую политику.

В странах Европейского союза зелёное развитие сельского хозяйства осуществляется в рамках Общей сельскохозяйственной политики (Common Agricultural Policy, CAP), которая ориентирована на интеграцию экологических требований в систему государственной поддержки аграрного производства. [5] В частности, CAP предусматривает финансовое стимулирование органического земледелия, реализацию агроэкологических и климатических мер, снижение антропогенной нагрузки на почвы и водные ресурсы, а также внедрение технологий, обеспечивающих адаптацию сельского хозяйства к изменению климата. Существенное внимание уделяется поддержке фермеров, внедряющих практики устойчивого землепользования и сохранения биоразнообразия. [9]

В Соединённых Штатах Америки и Канаде приоритетным направлением зелёной трансформации аграрного сектора является развитие точного земледелия, основанного на использовании цифровых технологий, геоинформационных систем, дистанционного зондирования Земли и аналитики больших данных. [8] Эти инструменты позволяют оптимизировать применение удобрений и средств защиты растений, повысить эффективность водопользования и сократить выбросы парниковых газов, одновременно обеспечивая рост производительности и снижение издержек сельскохозяйственного производства. [13]

В Соединённых Штатах Америки внедрение водосберегающих технологий орошения рассматривается как один из ключевых инструментов повышения устойчивости сельского хозяйства в условиях изменения климата и нарастающего дефицита водных ресурсов, особенно в западных и юго-западных штатах. В период 2020–2024 гг. наблюдается устойчивая тенденция роста доли современных систем орошения, включая капельное и высокоэффективное спринклерное орошение (LESA, LEPA), а также интеграцию цифровых систем управления водоподачей. [12]

Согласно данным USDA Economic Research Service, в США преобладают водосберегающие прессуризованные системы орошения (спринклерные и капельные), охватывающие около 72 % общей площади орошаемых земель, что свидетельствует о высокой степени внедрения эффективных ирригационных технологий. Наиболее активное внедрение отмечается в штатах Калифорния, Аризона, Небраска и Техас, где сельское хозяйство характеризуется высокой водоёмкостью и зависимостью от подземных источников воды. Существенную роль в этом процессе сыграли федеральные программы поддержки, такие как Environmental Quality

Incentives Program (EQIP), направленные на субсидирование фермеров, внедряющих ресурсосберегающие технологии. [11]

Одновременно с расширением площадей, оснащённых водосберегающим орошением, в США фиксируется снижение среднего объёма водопотребления на гектар орошаемых земель и рост водной продуктивности сельскохозяйственных культур. Это свидетельствует о том, что внедрение современных систем орошения сопровождается не только экологическим эффектом, но и повышением экономической эффективности аграрного производства.

Таким образом, опыт США демонстрирует, что сочетание государственной финансовой поддержки, технологических инноваций и цифровых инструментов управления водными ресурсами обеспечивает устойчивую динамику внедрения водосберегающего орошения и может служить ориентиром для адаптации аналогичных механизмов в других странах, включая Республику Узбекистан.

В странах Восточной Азии, прежде всего в Китае и Японии, активно реализуются концепции «умных ферм» (smart farming), основанные на автоматизации производственных процессов, использовании робототехники и позволяющие формировать замкнутые циклы использования ресурсов. [7] Государственные программы экологической модернизации аграрного сектора в данных странах направлены на снижение ресурсной ёмкости сельского хозяйства, минимизацию отходов производства и повышение экологической устойчивости агропродовольственных систем. [14]

Согласно официальным данным Министерства сельского хозяйства Китая, к 2020 году суммарная площадь водосберегающего орошения в КНР достигла около 37,8 млн га, что отражает масштабные инвестиции в спринклерные, трубные и другие современные ирригационные технологии. [3] К 2022 году более 26,6 млн га орошаемых земель были оснащены высокоэффективными системами водосбережения, такими как капельное и специализированное автоматизированное орошение, что свидетельствует о продолжении политики модернизации ирригационной инфраструктуры страны. [4]

Как уже было отмечено, положительная динамика обусловлена реализацией государственных программ модернизации ирригационной инфраструктуры, развитием «умного сельского хозяйства» и усилением контроля за использованием водных ресурсов. Существенную роль играют инвестиции в цифровые технологии, автоматизацию водораспределения и формирование замкнутых циклов водопользования. Опыт Китая также подтверждает, что масштабная институциональная поддержка позволяет эффективно сочетать рост сельскохозяйственного производства с повышением водной и экологической эффективности.

Анализ мирового опыта свидетельствует о том, что при наличии эффективной институциональной поддержки, устойчивых финансовых механизмов и целевых инвестиций в инновационные технологии зелёное

сельское хозяйство становится важным фактором повышения устойчивости, адаптивности и конкурентоспособности аграрного производства. [6] Кроме того, внедрение принципов зелёного развития способствует укреплению продовольственной безопасности, сохранению природных ресурсов и достижению долгосрочных целей устойчивого развития. [10]

Для оценки динамики зелёного развития сельского хозяйства в Узбекистане были систематизированы количественные показатели на основе национальных статистических данных и аналитических отчётов. Анализ сосредоточен на эффективности водопользования, внедрении водосберегающих технологий, расширении органического земледелия и росте производительности.

Согласно данным FAO AQUASTAT, средний уровень водопотребления в традиционном орошаемом земледелии в странах Центральной Азии превышает 10 тыс. м³ на 1 га. Применение капельного и дождевального орошения позволяет сократить водопотребление на 30–50 % и одновременно повысить устойчивость урожайности. Расширение таких технологий в Узбекистане способствует повышению водоэффективности сельскохозяйственного производства.

Узбекистан занимает седьмое место в мире и первое в Центральной Азии по внедрению водосберегающих технологий в расчете на общую площадь орошаемых земель. По данным Министерства водного хозяйства Республики Узбекистан, до 2018 года площадь, на которой были внедрены водосберегающие технологии, составляла 28 тыс. гектаров, в 2023 году такие технологии были внедрены на площади 413,1 тысяч гектаров орошаемых земель, в том числе 77,3 тысячи гектаров капельного орошения, 25,4 тысяч гектаров дождевального орошения, 13 тысяч гектаров дискретного орошения, 74,7 тысячи гектаров других видов водосберегающих технологий, а также 222,8 тысячи гектаров посевных земель были выровнены с помощью лазерного оборудования. [15] В 2024 году площадь охваченных водосберегающими технологиями сельскохозяйственных земель увеличилась на 849 тыс. га, до 2 млн га, системы капельного орошения установили на 85 тыс. га сельхозугодий, дождевальное и дискретное орошение - на 37 тыс. и 31 тыс. га соответственно. В 2024 году было сэкономлено 1,4 млрд м³ воды благодаря этим технологиям. [16]

Полученные данные свидетельствуют о стабильном росте масштабов внедрения водосберегающих технологий и одновременном снижении водопотребления на единицу площади. Согласно анализу, внедрение водосберегающих технологий увеличивает урожайность хлопчатника на 10-15 центнеров, при этом экономится 20-60% водных ресурсов, топлива, смазочных материалов и минеральных удобрений – на 25-35%. [17]

Сравнительный анализ показывает, что Узбекистан пока уступает развитым странам по доле органических земель и уровню внедрения точного земледелия, однако демонстрирует значительный прогресс в повышении

эффективности водопользования по сравнению с рядом региональных аналогов (табл.1).

Таблица 1. Сравнительные показатели развития зелёного сельского хозяйства, 2024 г.

Регион / страна	Доля органических земель, %	Среднее водопотребление на 1 га, тыс. м³	Применение точного земледелия, %
Европейский союз	9,6	6,5	52
США	6,1	7,2	48
Китай	3,5	8,0	41
Узбекистан	2,1	8,7	28

Несмотря на достигнутые положительные результаты, масштабное внедрение зелёного сельского хозяйства в Узбекистане сдерживается рядом факторов, включая ограниченный доступ малых фермерских хозяйств к современным технологиям, недостаточный уровень экологической осведомлённости производителей и институциональные ограничения. Крупные и экспортно ориентированные хозяйства внедряют современные технологии более активно, тогда как малые фермерские хозяйства сталкиваются с финансовыми и институциональными ограничениями. По сравнению с развитыми странами темпы внедрения «зеленых» технологий остаются неравномерными, развитие зелёного сельского хозяйства в Узбекистане характеризуется низкой долей органического земледелия и цифровых агротехнологий, это подчёркивает необходимость усиления системной государственной политики, консультационно-информационной поддержки, развития консультационных служб и инвестиций в человеческий капитал.

Заключение

Зелёное развитие сельского хозяйства является стратегическим направлением обеспечения устойчивого экономического роста и экологической безопасности во всем мире. Международная практика подтверждает эффективность внедрения ресурсосберегающих и экологически ориентированных технологий. Международный опыт также показывает, что успешное развитие зелёного сельского хозяйства требует согласованной государственной политики, долгосрочных инвестиций и активного участия всех заинтересованных сторон.

В Республике Узбекистан наблюдается существенное расширение применения ресурсосберегающих технологий и рост эффективности использования земельно-водных ресурсов. В то же время дальнейшее развитие зелёного сельского хозяйства требует углубления институциональных реформ, расширения доступа фермеров к инновациям и повышения уровня экологической культуры. Реализация данных мер позволит обеспечить долгосрочную устойчивость аграрного сектора страны.

Для Узбекистана адаптация передовых практик с учётом местных климатических, экономических и социальных условий является ключевым фактором эффективности и устойчивости реформ.

Использованные источники:

1. Постановление Президента Республики Узбекистан от 04.10.2019 г. № ПП-4477 «Об утверждении Стратегии по переходу Республики Узбекистан на «зеленую» экономику на период 2019 - 2030 годов».
2. Постановление Президента Республики Узбекистан от 02.12.2022 г. № ПП-436 «О мерах по повышению эффективности реформ, направленных на переход Республики Узбекистан на «зеленую» экономику до 2030 года».
3. China's agricultural water-use efficiency improves [Электронный ресурс]. – Ministry of Agriculture and Rural Affairs of the People's Republic of China, 09.11.2022. – Режим доступа: https://english.moa.gov.cn/roll/202211/t20221109_301006.html (дата обращения: 15.01.2026).
4. China's water-saving irrigation area reaches 37.8 million hectares [Электронный ресурс]. – Xinhua / CCTV English Service, 04.07.2021. – Режим доступа: <https://english.cctv.com/2021/07/05/ARTI2MqRDT0H2enROW4jnReo210705.shtml> (дата обращения: 15.01.2026).
5. European Commission. The Common Agricultural Policy at a glance [Электронный ресурс]. – Brussels: European Commission, 2023. – Режим доступа: <https://commission.europa.eu> (дата обращения: 15.01.2026).
6. FAO. Climate-smart agriculture sourcebook. – Rome: Food and Agriculture Organization of the United Nations, 2019. – 564 p.
7. FAO. Smart farming for sustainable agriculture in Asia and the Pacific. – Bangkok: FAO Regional Office for Asia and the Pacific, 2021. – 98 p.
8. Government of Canada. Sustainable Canadian Agricultural Partnership 2023–2028 [Электронный ресурс]. – Ottawa: Agriculture and Agri-Food Canada, 2023. – Режим доступа: <https://agriculture.canada.ca> (дата обращения: 15.01.2026).
9. OECD. Innovation, productivity and sustainability in food and agriculture. – Paris: OECD Publishing, 2022. – 212 p. – DOI: 10.1787/innovative-agriculture-2022-en.
10. OECD, FAO. Agricultural Outlook 2023–2032. – Paris; Rome: OECD Publishing; FAO, 2023. – 330 p.
11. United States Department of Agriculture (USDA). Irrigated agriculture in the United States [Электронный ресурс]. – Washington, DC: USDA Economic Research Service, 2023. – Режим доступа: <https://www.ers.usda.gov>
12. USDA. Precision Agriculture and Resource Efficiency in U.S. Farming [Электронный ресурс]. – Washington, DC: United States Department of Agriculture, 2022. – Режим доступа: <https://www.usda.gov> (дата обращения: 15.01.2026).
13. World Bank. Digital agriculture: Technologies for productivity and

sustainability. – Washington, DC: World Bank Group, 2021. – 176 p.

14. Zhang, Y., Wang, L. Green transformation of agriculture in China under climate change // Journal of Cleaner Production. – 2020. – Vol. 276. – P. 124–132. – DOI: 10.1016/j.jclepro.2020.123456.

15. Central Asia Water Info. Water yearbook of Uzbekistan, 2023 [Электронный ресурс]. – Режим доступа: https://cawater-info.net/yearbook/2023/05_yearbook2023_uz_en.htm (дата обращения: 15.01.2026).

16. Kursiv Uzbekistan. V 2024 godu vodosberegayushchie tekhnologii vnedrili na 849 tys. ga [Электронный ресурс]. – 23.01.2025. – Режим доступа: <https://uz.kursiv.media/2025-01-23/v-2024-godu-vodosberegayushhie-tehnologii-vnedrili-na-849-tys-ga/> (дата обращения: 15.01.2026).

17. Asia-Plus. Uzbekistan seeks to introduce new technologies to improve irrigation of agricultural lands [Электронный ресурс]. – 14.02.2024. – Режим доступа: <https://www.asiaplustj.info/en/news/centralasia/20240214/uzbekistan-seeks-to-introduce-new-technologies-to-improve-irrigation-of-agricultural-lands> (дата обращения: 15.01.2026).

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СНИЖЕНИЕ УРОВНЯ АКТИВНОСТИ У ДЕТЕЙ: АНАЛИЗ СОВРЕМЕННЫХ ТЕНДЕНЦИЙ

Аннотация: Современное общество столкнулось с серьезной проблемой резкого снижения физической нагрузки у подрастающего поколения. В данной работе исследуются ключевые причины «исчезновения» естественной двигательной активности из повседневной жизни детей. Актуальность темы обусловлена стремительным распространением малоподвижного образа жизни среди школьников. Проблема исследования заключается в том, что при очевидной необходимости движения многие дети не достигают минимальных рекомендованных норм активности. В статье подчеркивается прямая связь между гиподинамией и ростом хронических заболеваний у несовершеннолетних. В заключении предлагаются практические рекомендации по восстановлению активного режима дня в современных условиях. На основе полученных данных делаются выводы о необходимости комплексного подхода к решению проблемы на уровне семьи и школы.

Ключевые слова: образа жизни, двигательная активность, мышечный корсет, здоровье, эмоциональное состояние, привычки, организм

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DECLINING ACTIVITY LEVELS IN CHILDREN: AN ANALYSIS OF CURENT TRENDS

Annotation: Modern society faces the serious problem of a sharp decline in physical activity among the younger generation. This paper examines the key reasons for the "disappearance" of natural physical activity from children's daily lives. The relevance of this topic is driven by the rapid spread of sedentary lifestyles among schoolchildren. The problem with the study is that, despite the obvious need for movement, many children fail to achieve the minimum recommended activity levels. The article highlights a direct link between physical inactivity and the rise in chronic diseases in adolescents. The conclusion offers practical recommendations

for restoring an active daily routine in today's environment. Based on the data obtained, conclusions are drawn about the need for a comprehensive approach to addressing the problem at the family and school levels.

Keywords: *lifestyle, physical activity, muscular corset, health, emotional state, habits, organism.*

Введение

В последние годы всё больше внимания уделяется состоянию здоровья детей и подростков, поскольку изменения образа жизни напрямую отражаются на физическом и эмоциональном развитии подрастающего поколения. Одной из наиболее заметных тенденций стало устойчивое снижение уровня двигательной активности. Современные дети стали меньше гулять, реже участвуют в подвижных играх и спортивных занятиях, предпочитая цифровые формы досуга.

Актуальность темы обусловлена стремительным распространением малоподвижного образа жизни среди школьников. Технологизации среды, рост учебной нагрузки, изменение характера досуга и снижение возможностей для безопасных прогулок приводят к тому, что норма естественного движения заменяется продолжительным сидением. Это вызывает рост гиподинамии, ухудшение осанки, нарушения обмена веществ и снижение интереса к физической культуре.

Проблема исследования заключается в том, что при очевидной необходимости движения многие дети не достигают минимальных рекомендованных норм активности, а родители и педагоги зачастую недооценивают последствия такого снижения

Объект исследования — двигательная активность детей и подростков в современном обществе.

Предмет исследования — особенности снижения подвижности и факторы, влияющие на отказ детей от активных форм поведения.

Цель проекта — изучить причины уменьшения двигательной активности у детей, определить последствия этого процесса и предложить доступные способы повышения уровня подвижности среди школьников.

Для достижения поставленной цели необходимо решить следующие задачи:

1. раскрыть значение двигательной активности для физического и психического здоровья ребёнка;
2. определить ключевые факторы, влияющие на снижение подвижности в детском возрасте;
3. проанализировать основные проблемы, возникающие в результате недостатка движения;
4. изучить современные подходы к восстановлению активности и мотивации детей;
5. провести социологический опрос для выявления отношения школьников к физической активности;

6. выполнить анализ результатов исследования и сформулировать выводы;

7. разработать информационный буклет, направленный на популяризацию регулярной двигательной активности среди детей и подростков.

Таким образом, введение задаёт логическую основу проекта и подчёркивает актуальность изучения вопроса о том, почему современные дети двигаются меньше и какие пути решения могут помочь изменить эту ситуацию.

Глава 1. Двигательная активность детей в современном обществе

1.1 ПОНЯТИЕ ДВИГАТЕЛЬНОЙ АКТИВНОСТИ И ЕЁ ЗНАЧИМОСТЬ ДЛЯ ЗДОРОВЬЯ РЕБЁНКА

Двигательная активность является одной из основ естественного развития ребёнка. Под этим понятием понимают любую форму физической нагрузки, связанную с движением: ходьбу, бег, игры, занятия спортом, подвижные перерывы, активные прогулки и даже бытовую активность. Для ребёнка движение — это не просто способ тренировки мышц, а природная потребность, обеспечивающая рост, формирование костно-мышечной системы, работу сердца, лёгких и мозга. Оно является важной частью физического, эмоционального и социального развития.

Научные исследования подтверждают, что дети, которые достаточно двигаются, быстрее развивают координацию, внимание, способность к обучению и стрессоустойчивость. Благодаря регулярной активности формируются жизненно важные навыки: умение работать в команде, выдерживать нагрузки, контролировать эмоции и ставить цели.

Значимость двигательной активности особенно велика в детском возрасте, когда организм растёт наиболее интенсивно. В этот период формируется осанка, укрепляется мышечный корсет, развивается дыхательная и сердечно-сосудистая системы. Если ребёнок ведёт малоподвижный образ жизни, процессы развития замедляются, что может привести к нарушениям осанки, избыточному весу, быстрому утомлению, ухудшению концентрации внимания и снижению интереса к обучению.

Двигательная активность играет важную роль и в эмоциональном состоянии ребёнка. Подвижные игры и спорт помогают справляться с тревожностью, улучшают настроение, способствуют снятию психологического напряжения, которое возникает из-за учебной нагрузки и длительного пребывания за гаджетами. Активность позволяет детям выражать энергию, развивать уверенность в себе и ощущение контроля над собственным телом.

Важно учитывать, что естественная потребность в движении снижается, если ребёнок сталкивается с перегрузкой учебными заданиями, отсутствием времени для прогулок, недостатком безопасных игровых площадок или заменяет активные формы досуга электронными устройствами. Поэтому

понимание роли двигательной активности становится ключом к сохранению здоровья подрастающего поколения.

Таким образом, двигательная активность — это неотъемлемая часть полноценного развития ребёнка. Она обеспечивает здоровье, формирование жизненно важных навыков и влияет на качество жизни в будущем. Именно поэтому проблема снижения подвижности требует особого внимания со стороны семьи, школы и общества.

1.2 ОСНОВНЫЕ ФАКТОРЫ, ВЛИЯЮЩИЕ НА СНИЖЕНИЕ ЕЖЕДНЕВНОЙ ПОДВИЖНОСТИ

Снижение двигательной активности среди детей — это результат комплексного влияния сразу нескольких факторов, связанных как с изменением образа жизни, так и с особенностями современной социальной среды. За последние годы привычная модель детства претерпела существенные изменения: активные игры на улице всё чаще заменяются цифровым досугом, а время свободного движения сокращается. Чтобы понять причины снижения подвижности, важно рассмотреть основные факторы, определяющие ежедневную активность ребёнка.

Одним из ведущих факторов является увеличение времени, проводимого за цифровыми устройствами. Смартфоны, планшеты, игровые приставки и компьютеры стали частью привычного образа жизни. Дети используют их не только для развлечений, но и для учёбы, общения, получения информации. Результатом становится сокращение времени, которое ранее уделялось прогулкам, подвижным играм и занятиям спортом. Цифровая среда формирует у ребёнка устойчивую привычку к сидячему времяпровождению, что ведёт к появлению гиподинамии.

Не менее значимым фактором является рост учебной нагрузки. Современная школа предъявляет высокие требования к детям: возрастает объём домашних заданий, увеличивается время подготовки к урокам и экзаменам, распространены занятия с репетиторами. Длительное сидение за учебными материалами приводит к усталости, а у ребёнка остаётся меньше сил и времени на активный отдых.

Существенную роль играет и изменение структуры досуга. Если раньше большинство игр предполагало активность, то сегодня многие формы отдыха связаны с минимальными затратами энергии. Виртуальные игры, просмотр видео, общение в социальных сетях занимают значительное место в жизни ребёнка. Свободное время, которое могло бы быть использовано для спорта или прогулок, заполняется малоподвижными видами деятельности.

Ещё одним фактором является снижение доступности безопасных игровых и спортивных пространств. Не все районы обеспечены оборудованными площадками, дворами или секциями, где дети могут свободно двигаться. В некоторых местах наблюдаются проблемы с освещением, состоянием территории или отсутствием спортивной инфраструктуры. Это ограничивает возможности для активного отдыха вне дома и делает пребывание на улице менее привлекательным.

Важную роль играет и семейный стиль жизни. Если родители редко занимаются спортом, проводят много времени за компьютером или постоянно заняты работой, дети перенимают такую модель поведения. Сейчас всё чаще встречаются ситуации, когда семья проводит свободное время дома, не включая в досуг прогулки или активные занятия.

Наконец, значительным фактором является эмоциональная и психологическая усталость. Перегрузки в школе, стрессовые ситуации, отсутствие полноценного отдыха снижают мотивацию к движению.

Таким образом, снижение двигательной активности обусловлено сочетанием цифровых, социальных, образовательных и психологических факторов. Они формируют у детей устойчивую привычку к малоподвижному образу жизни, что делает проблему особенно актуальной и требует внимания как со стороны семьи, так и со стороны образовательных учреждений.

1.3 ПРОБЛЕМЫ И ПОСЛЕДСТВИЯ ГИПОДИНАМИИ У ДЕТЕЙ И ПОДРОСТКОВ

Гиподинамия, то есть недостаток двигательной активности, становится одной из наиболее серьёзных проблем современного детского и подросткового возраста. Она формируется постепенно, часто незаметно для родителей и педагогов, но её последствия проявляются во многих сферах жизни ребёнка. В условиях, когда подвижность естественным образом заменяется малоподвижными занятиями, нарушается гармоничное развитие организма, и это приводит к ряду медицинских, психологических и социальных последствий.

Одним из основных последствий гиподинамии является ухудшение состояния опорно-двигательного аппарата. Недостаток движения приводит к ослаблению мышечного корсета, что способствует возникновению нарушений осанки, сколиоза, плоскостопия и хронических болей в спине. У детей, которые долго проводят время сидя, формируются стойкие изменения в позвоночнике, что в дальнейшем может повлиять на работоспособность и общий уровень здоровья во взрослом возрасте.

Не менее серьёзные последствия наблюдаются со стороны сердечно-сосудистой и дыхательной систем. Малоподвижный образ жизни способствует снижению выносливости, учащённому сердцебиению, одышке и быстрой утомляемости даже при небольших нагрузках. У детей с низким уровнем активности чаще встречается избыточный вес, который усугубляет нагрузку на организм и увеличивает риск развития метаболических нарушений. Гиподинамия становится одним из факторов раннего формирования предрасположенности к диабету, гипертонии и другим хроническим заболеваниям.

Важную роль играет и влияние гиподинамии на психическое и эмоциональное состояние подростков. Движение является естественным механизмом снятия напряжения, улучшения настроения и регуляции эмоционального фона. Когда физическая активность отсутствует, возрастает уровень тревожности, раздражительности и утомляемости. Некоторые дети

начинают испытывать трудности с концентрацией внимания, замедлением мыслительных процессов и снижением учебной мотивации.

Проблемы гиподинамии отражаются и на социальной сфере. Активные игры, занятия спортом и совместные прогулки традиционно способствовали развитию навыков общения, умению работать в команде, уверенности в себе и инициативности. Когда эти формы взаимодействия исчезают, снижается уровень коммуникативной активности, дети становятся менее включёнными в коллективные занятия, им сложнее адаптироваться, устанавливать новые контакты и формировать дружеские отношения. Это может приводить к социальной замкнутости, неуверенности и снижению интереса к внешнему миру.

Таким образом, гиподинамия — это не просто временное уменьшение подвижности, а комплексная проблема, затрагивающая здоровье, эмоциональное состояние и социальное развитие ребёнка. Последствия недостатка движения формируются постепенно, но оказывают длительное влияние, поэтому важно своевременно выявлять признаки гиподинамии и предпринимать меры для увеличения ежедневной активности детей и подростков.

Глава 2. Причины падения двигательной активности и современные подходы к её восстановлению

2.1 ИСТОРИЯ ИЗМЕНЕНИЯ ОБРАЗА ЖИЗНИ ДЕТЕЙ: ОТ АКТИВНОЙ ИГРЫ К ЦИФРОВОМУ ФОРМАТУ ДОСУГА

Чтобы понять, почему современные дети стали меньше двигаться, важно проследить, как менялся образ жизни подрастающего поколения на протяжении последних десятилетий. Ещё двадцать–тридцать лет назад детство было неразрывно связано с активными играми на улице, длительными прогулками, спортивными секциями и подвижными формами общения. Дети собирались во дворах, придумывали новые игры, катались на велосипедах и проводили время вне дома, что способствовало развитию выносливости, силы, ловкости и социальной активности.

С развитием технологий и изменением социального уклада ситуация постепенно начала меняться. Цифровые устройства начали занимать всё больше места в жизни школьников, а активные игры стали заменяться виртуальными развлечениями. Изначально техника использовалась преимущественно для обучения и редких игр, но со временем она превратилась в основную форму отдыха, вытесняя движение на второй план.

Существенное влияние оказал и рост информационной доступности. Интернет стал источником бесконечного контента, который легче и быстрее воспринимать в формате видео, игр или социальных сетей. Дети получили возможность проводить время интересно, но при этом практически не двигаясь. Постепенно цифровой формат стал восприниматься как более привлекательный и простой, чем физическая активность, требующая усилий и временных затрат.

Изменился и социальный контекст. В современных городах стало меньше безопасных пространств для прогулок, а во многих дворах исчезли привычные игровые площадки, что сократило возможности для активных игр вне дома. Родители стали больше беспокоиться о безопасности детей, поэтому чаще предпочитали семейный досуг в помещении. Всё это способствовало переходу от уличного сообщества к индивидуальному цифровому общению.

Таким образом, образ жизни современных детей изменился под влиянием технологического прогресса, смены форм досуга, роста учебной нагрузки и изменений городской среды. Подвижные игры постепенно уступили место цифровому формату, и это привело к снижению ежедневной активности. Понимание этих исторических изменений необходимо для поиска путей, которые помогут вернуть движение в повседневную жизнь школьников.

2.2 ЦЕЛИ И ЗАДАЧИ ФОРМИРОВАНИЯ ЗДОРОВОЙ ФИЗИЧЕСКОЙ СРЕДЫ

Формирование здоровой физической среды является одним из ключевых условий, способных остановить снижение двигательной активности детей и вернуть движение в их повседневную жизнь. Под физической средой понимают совокупность условий, в которых ребёнок живёт, учится, отдыхает и проводит свободное время. Современная ситуация показывает, что только системный подход позволяет изменить устоявшиеся привычки и сделать активный образ жизни естественной частью детства.

Основной целью формирования здоровой физической среды является создание условий, в которых движение становится привычным, доступным и привлекательным для ребёнка. Важно, чтобы активность присутствовала не только на уроках физкультуры, но и в повседневных занятиях — дома, в школе, на улице, в секциях и досуговых пространствах. Такая среда должна мотивировать детей двигаться, снижать влияние гиподинамии и помогать им закреплять полезные привычки, которые будут сопровождать их во взрослом возрасте.

Задачей физической среды является также обеспечение безопасности. Дети должны иметь возможность свободно гулять, играть и заниматься спортом в условиях, не создающих рисков для здоровья. Оборудованные спортивные площадки, безопасные пешеходные зоны, велодорожки, доступные спортивные секции — всё это позволяет ребёнку чувствовать себя защищённым и уверенным во время активности. Безопасность важна и в школьной среде: наличие спортивного инвентаря, пространство для перемен и возможность проводить активные игры делают движение частью школьного распорядка.

Не менее значимая задача — формирование позитивного отношения к физической активности. Учителя, родители и окружение играют ключевую роль в том, как ребёнок воспринимает движение. Если взрослые поддерживают активный стиль жизни и демонстрируют собственный положительный опыт, детям легче включаться в спорт, проявлять инициативу

и интерес. Создание благоприятной атмосферы вокруг движения помогает преодолеть страхи, неуверенность или нежелание, которые часто формируются у детей на фоне усталости и чрезмерных учебных нагрузок.

Важной задачей является доступность разнообразных форм активности. Разные дети имеют разные интересы: кто-то предпочитает командные игры, кто-то индивидуальные виды спорта, кто-то прогулки или туристические маршруты. Чтобы поддержать подвижность, среда должна предлагать несколько вариантов активности, позволяя каждому ребёнку выбирать подходящий и комфортный формат. Это помогает избежать принуждения и сделать движение естественной частью жизни, а не обязанностью.

Таким образом, формирование здоровой физической среды направлено на создание пространства, которое объединяет безопасность, доступность, привлекательность и разнообразие возможностей для движения. Именно такой подход позволяет вернуть детям интерес к активности и создать условия, в которых подвижность снова станет привычной и необходимой частью их ежедневного распорядка.

2.3 ОБЩЕСТВЕННАЯ ДИСКУССИЯ: АРГУМЕНТЫ «ЗА» И «ПРОТИВ» УСИЛЕНИЯ КОНТРОЛЯ ЗА УРОВНЕМ ДЕТСКОЙ АКТИВНОСТИ

Вопрос о необходимости усиленного контроля за уровнем физической активности детей вызывает в обществе большой интерес и порождает разные точки зрения. Несмотря на то, что проблема гиподинамии становится всё более очевидной, подходы к её решению обсуждаются достаточно противоречиво. Родители, педагоги, медицинские специалисты и представители образовательной системы оценивают ситуацию по-разному, что формирует широкое поле общественной дискуссии.

Сторонники усиления контроля считают, что снижение двигательной активности достигло уровня, при котором требуется системное вмешательство. Они подчёркивают, что дети не всегда способны самостоятельно регулировать баланс между цифровым досугом и физическими нагрузками, а значит, взрослые должны помогать формировать правильные привычки. С этой точки зрения контроль не рассматривается как ограничение, а скорее как мера поддержки, направленная на сохранение здоровья и предотвращение хронических заболеваний. Представители медицинского сообщества отмечают, что гиподинамия приводит к нарушению осанки, слабости мышц, снижению иммунитета и увеличению риска ожирения, поэтому регулярная физическая активность должна закрепляться на уровне школьных программ и семейных правил. Поддерживается и идея создания более доступной инфраструктуры: спортивных площадок, секций, кружков, где дети смогут заниматься под присмотром специалистов.

Однако противники чрезмерного контроля выражают опасения, что усиление внешнего регулирования может привести к дополнительному давлению на детей. Они считают, что чрезмерное вмешательство взрослых

способно вызвать у школьников негативное отношение к спорту и ощущение принуждения, что снижает мотивацию к самостоятельной активности. Некоторые родители также высказывают мнение, что повышение контроля может привести к перегруженности детей, которые и так испытывают значительное учебное и эмоциональное напряжение. Обсуждается и вопрос свободы выбора: важно, чтобы ребёнок сам проявлял интерес к движению, а не воспринимал активность как обязательный элемент распорядка.

Отдельное направление дискуссии касается роли школы. С одной стороны, многие считают, что образовательные учреждения должны уделять больше внимания физической подготовке, вводить дополнительные подвижные перемены, развивать спортивные секции и корректировать учебный режим. С другой стороны, звучат опасения, что школа не может и не должна полностью отвечать за физическое состояние детей, поскольку значительная часть ответственности лежит на семье.

Таким образом, общественная дискуссия показывает, что проблема снижения активности требует взвешенного подхода. Большинство участников обсуждения согласны с тем, что детям необходима поддержка и условия для движения, однако разнятся мнения о степени вмешательства взрослых и способах достижения этой цели. Спор между сторонниками и противниками контроля подчёркивает необходимость гибких решений, которые будут учитывать индивидуальные особенности детей, сохранять их мотивацию и обеспечивать комфортные условия для формирования активного образа жизни.

Глава 3. Практическая часть: анализ отношения школьников к двигательной активности

3.1 МОИ ОЖИДАНИЯ И ПРЕДПОЛОЖЕНИЯ ОТНОСИТЕЛЬНО ИССЛЕДОВАНИЯ

Перед началом практической части исследования было важно сформировать собственное представление о том, как дети и подростки относятся к физической активности и понимают ли они значение движения для здоровья. Предполагалось, что результаты опроса покажут неоднозначную картину: с одной стороны, школьники знают о пользе активности, но с другой — не всегда готовы уделять ей достаточно времени. Мне казалось, что многие участники опроса признают, что стали меньше двигаться по сравнению с предыдущими годами, и назовут основной причиной увлечение цифровыми устройствами и постоянную занятость учёбой. Ожидалось также, что часть респондентов отметит недостаток мотивации и отсутствие условий для регулярных занятий спортом.

Я предположил, что большинство учащихся подтвердит актуальность проблемы гиподинамии и признает, что ежедневной активности не хватает. При этом мне было интересно узнать, насколько школьники готовы изменять свой образ жизни и что, по их мнению, могло бы помочь им больше двигаться: поддержка семьи, более интересные школьные занятия по физкультуре, доступные секции или улучшение инфраструктуры в районе проживания. Я

ожидал, что часть респондентов укажет на эмоциональную усталость и нехватку времени, что также может стать важным фактором, мешающим активному досугу.

Таким образом, мои предположения заключались в том, что опрос выявит сочетание осознания важности движения и фактического его недостатка. Я рассчитывал получить ответы, которые помогут точнее определить реальные причины снижения активности и сформировать рекомендации, направленные на восстановление интереса школьников к подвижному образу жизни.

3.2 СОЦИОЛОГИЧЕСКИЙ ОПРОС: ОПИСАНИЕ И РЕЗУЛЬТАТЫ

ПРАКТИЧЕСКАЯ РАБОТА №1

В рамках практической части проекта было проведено исследование, направленное на выявление отношения школьников и взрослых к снижению двигательной активности детей. Перед опросом предполагалось, что многие участники осознают проблему, но при этом недостаточно понимают её причины и возможные последствия. Опрос проводился среди 30 человек в возрасте от 13 до 45 лет. Участникам предлагалось ответить на вопросы, касающиеся частоты их физической активности, времени, которое они проводят за гаджетами, и оценки собственного образа жизни.

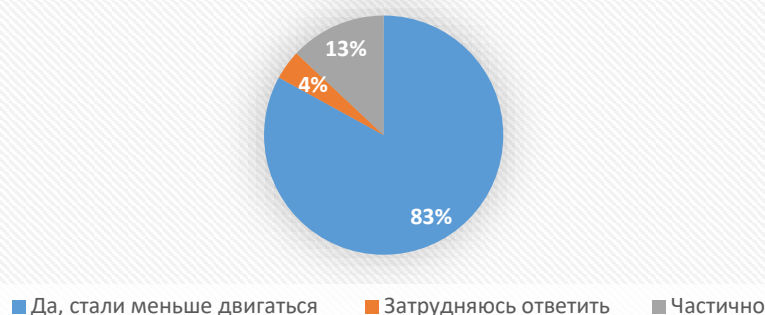
Первый вопрос касался того, считают ли респонденты, что современные дети действительно стали двигаться меньше. Результаты показали, что 83% участников полностью согласны с этим утверждением, 13% считают, что активность снизилась частично, и лишь 4% затруднились с ответом. Это подтверждает, что снижение подвижности является заметным явлением, которое воспринимается большинством опрошенных как серьёзная тенденция.

Следующий вопрос касался причин, которые, по мнению участников, влияют на снижение активности. Большинство респондентов — 67% — указали, что основным фактором являются цифровые устройства. 20% отметили перегрузку учебой, а 13% считают, что дети меньше выходят на улицу из-за нехватки безопасных площадок. Эти результаты совпали с моими предположениями, согласно которым цифровизация досуга является главным условием сокращения времени, посвящённого движению.

Третий вопрос был направлен на оценку влияния гиподинамии на здоровье. 72% участников считают, что недостаток движения приводит к ухудшению самочувствия, снижению выносливости, нарушению осанки и эмоциональной нестабильности. 18% отметили, что последствия могут проявиться только в старшем возрасте, и 10% признали, что не задумывались о долгосрочном влиянии малоподвижного образа жизни.

По итогам первой практической работы была составлена диаграмма «Отношение респондентов к проблеме снижения двигательной активности»

Отношение респондентов к проблеме снижения двигательной активности



Практическая работа №2

Вторая часть исследования была посвящена изучению отношения к физической активности среди учащихся 10–11 классов. В опросе приняли участие 20 школьников. Перед его проведением предполагалось, что многие подростки признают недостаток движения, но при этом назовут причины, связанные с учебной нагрузкой и цифровым досугом.

На вопрос «Хватает ли вам ежедневной физической активности?» только 6 участников ответили утвердительно. Остальные 14 человек признали, что движения в их жизни недостаточно, и указали, что большую часть времени проводят за компьютером или телефоном.

Следующий вопрос касался того, что мешает подросткам больше двигаться. 9 учащихся назвали основным фактором нехватку времени, 7 — потерю интереса к спортивным занятиям, а 4 ученика отметили отсутствие удобных мест для прогулок. Эти данные показали, что причины снижения активности носят комплексный характер.

Особый интерес вызвал вопрос о готовности школьников изменить свой образ жизни. На него положительно ответили 12 учащихся, пояснив, что начали бы больше двигаться при наличии компании или интересной формы активности. 5 респондентов отметили, что им нужна поддержка со стороны родителей или педагогов, а 3 участника признались, что пока не испытывают желания что-либо менять.

При обсуждении того, какую роль играет школа в формировании подвижности, 15 учащихся отметили, что физкультура помогает поддерживать тонус, но выразили желание видеть больше разнообразных упражнений и элементов игровых видов спорта. Остальные 5 школьников считают, что школа не может полностью повлиять на образ жизни детей, потому что большую часть времени они проводят дома.

Результаты второй практической работы подтвердили мои ожидания: подростки понимают пользу активности, но им не хватает условий, времени и мотивации. Это показывает необходимость комплексного подхода к решению проблемы гиподинамии.

Таким образом, обе практические работы демонстрируют, что проблема снижения двигательной активности очевидна для большинства участников опроса, но причины и пути её решения воспринимаются по-разному. Полученные данные помогут сформировать рекомендации и разработать буклет, направленный на популяризацию активного образа жизни среди детей и подростков.

Глава 4. Разработка буклета «Почему дети стали меньше двигаться и как вернуть активность»

4.1 ЦЕЛЬ, СТРУКТУРА И СОДЕРЖАНИЕ БУКЛЕТА

Переходя от анализа результатов социологического опроса к разработке практического продукта, важно было представить полученную информацию в форме, доступной для широкого круга читателей — школьников, их родителей, педагогов и всех, кто интересуется вопросами сохранения здоровья детей. Именно поэтому итогом практической части стал буклет «Почему дети стали меньше двигаться и как вернуть активность». Такой формат выбран не случайно: он позволяет лаконично и наглядно раскрыть основные причины снижения подвижности, показать последствия гиподинамии и предложить конкретные рекомендации по увеличению ежедневной активности.

Цель буклета заключается в том, чтобы донести до читателя ключевую мысль: движение — это естественная и необходимая часть жизни ребёнка, а снижение физической активности не является безобидным явлением. Буклет призван помочь школьникам и их родителям осознать важность регулярной нагрузки, понять, где теряется время, которое можно было бы посвятить активности, а также познакомиться с простыми способами вернуть движение в повседневный образ жизни.

Структура буклета была продумана таким образом, чтобы материал воспринимался логично, последовательно и без перегрузки. На первой панели размещено краткое вступление о значимости двигательной активности для ребёнка. Этот раздел создаёт основу для понимания причин и последствий гиподинамии, подчёркивая, что движение влияет не только на физическое здоровье, но и на настроение, работоспособность и социализацию.

Следующий блок посвящён основным причинам снижения подвижности. В нём простыми словами объясняется, почему современные дети стали меньше двигаться: цифровой досуг, перегруженность учебной, нехватка безопасных площадок и изменение семейных привычек. Краткие формулировки позволяют легко соотнести эти причины с реальной жизнью школьников.

Центральное место занимает информационный раздел, посвящённый последствиям гиподинамии. Здесь представлено описание наиболее значимых рисков: нарушения осанки, снижение выносливости, ухудшение эмоционального состояния и влияние на социальное поведение. Этот блок подаётся максимально ясно, чтобы читатель мог понять, чем именно опасен

малоподвижный образ жизни и почему важно вовремя обратить внимание на изменения.

Завершающие панели буклета содержат практические рекомендации, направленные на увеличение двигательной активности. В отличие от сухих теоретических советов, этот раздел включает простые и выполнимые действия: короткие прогулки, активные перемены, участие в школьных и дворовых играх, выбор интересной спортивной секции.

Таким образом, буклет объединяет теоретическую информацию, данные опроса и практические рекомендации, превращаясь в удобный инструмент просвещения. Его структура позволяет быстро ориентироваться в материале, а содержание помогает школьникам и их родителям лучше понимать проблему гиподинамии и находить способы её решения в повседневной жизни.

4.2 ОФОРМЛЕНИЕ И ДИЗАЙН БУКЛЕТА

После анализа результатов опроса и определения ключевых идей, которые необходимо донести до читателя, следующим этапом стало оформление буклета. Так как тема проекта связана со здоровьем детей и популяризацией активного образа жизни, дизайн буклета должен был сочетать наглядность, доступность и современный визуальный стиль. Важно было создать макет, который будет не только информативным, но и привлекательным, чтобы школьники с интересом знакомились с материалом, а родители легко находили нужные сведения.

Работа над буклетом велась в программе PowerPoint, что позволило аккуратно разместить текстовые блоки, иллюстрации и декоративные элементы. Выбран формат трёхстворчатого буклета, который удобно складывается и содержит шесть информативных панелей. Такой формат делает материал структурированным и позволяет разделить содержание на логические части: причины снижения активности, последствия гиподинамии и рекомендации по увеличению движения.

Для оформления использована мягкая, но выразительная цветовая гамма, включающая оттенки светло-зелёного, голубого и жёлтого. Эти цвета ассоциируются со здоровьем, энергией, свежестью и природной активностью.

Текст оформлен понятными шрифтами, обеспечивающими хорошую читаемость. Для заголовков использовано крупное полужирное начертание, чтобы акцентировать внимание на основных разделах. Основной текст набран более мягким и ровным шрифтом с комфортным межстрочным интервалом — это делает чтение удобным и снижает визуальную нагрузку.

В буклете использованы обобщённые графические элементы: силуэты бегущих детей, иконки, обозначающие движение, стрелки, динамичные линии. Эти изображения подчеркивают тему активности, оживляют макет и создают ощущение движения. Иллюстрации выполнены в едином стиле, что делает внешний вид буклета целостным и гармоничным.

Особое внимание уделено тому, чтобы каждая панель буклета была визуально завершённой. Информация распределена равномерно: блоки с

текстом чередуются с небольшими графическими элементами, что создаёт баланс и облегчает восприятие. Такая композиция помогает читателю быстро находить нужные данные и лучше запоминать ключевую информацию.

В целом оформление буклета получилось аккуратным, современным и доступным для восприятия. Использование спокойных цветовых акцентов, простых шрифтов и лёгких графических элементов делает буклет удобным инструментом для школьников и родителей, а его структура обеспечивает логичное раскрытие темы и способствует интересу к двигательной



активности.

Рисунок 1 – Лицевая сторона буклета



Рисунок 2 – Внутренняя сторона буклета

Заключение

В ходе выполнения проекта удалось подробно изучить проблему снижения двигательной активности среди детей и подростков, рассмотреть её причины, последствия и возможные пути решения. Анализ теоретического материала показал, что гиподинамия становится одной из ключевых проблем современного поколения. Недостаток движения отрицательно влияет на физическое развитие, работу опорно-двигательной и сердечно-сосудистой систем, эмоциональное состояние и социальную активность детей. Переход от активных игр к цифровому досугу, высокая учебная нагрузка, изменения в организации школьной и городской среды — всё это постепенно формирует малоподвижный образ жизни.

В теоретической части проекта были раскрыты особенности двигательной активности, её роль в здоровье ребёнка и факторы, которые приводят к снижению подвижности. Также были рассмотрены изменения образа жизни детей за последние десятилетия и показано, как цифровые технологии постепенно вытесняют привычные формы активности. Это позволило понять, что проблема носит комплексный характер и требует системного подхода.

Практическая часть проекта, включающая социологический опрос, подтвердила актуальность выбранной темы. Большинство участников исследования признали, что современные дети действительно стали двигаться меньше, а причины этого они связывают прежде всего с использованием гаджетов и недостатком времени. Подростки отмечают, что хотели бы больше активности, но нередко сталкиваются с недостатком мотивации или условий. Эти данные совпали с первоначальными предположениями и позволили сделать вывод о необходимости целенаправленной работы с детьми и их окружением.

Итогом проекта стал информационный буклет, который в доступной форме объясняет, почему двигательная активность важна, какие последствия несёт гиподинамия и как можно вернуть движение в повседневную жизнь ребёнка. Буклет дополняет исследование и делает его практической значимость более очевидной, помогая распространять знания о проблеме среди школьников и их родителей.

Таким образом, цель проекта была достигнута, а поставленные задачи выполнены. Работа позволила глубже понять, как меняется образ жизни современных детей, какие риски связаны с недостатком движения и какие шаги можно предпринять для улучшения ситуации. Полученные результаты подчёркивают, что повышение двигательной активности — важная задача, требующая совместных усилий семьи, школы и общества. Только при внимательном отношении к этой проблеме возможно сформировать здоровые привычки и обеспечить гармоничное развитие подрастающего поколения.

Использованные источники:

1. Султанова А. Р. Гиподинамия у школьников в Удмуртской Республике // Вестник науки. — 2019. — Т. 3. — № 4 (13). — С. 70–73. — URL:

<https://cyberleninka.ru/article/n/gipodinamiya-u-shkolnikov-v-udmurtskoy-respublike>

2. Кудашова Л. Т. Формирование здорового образа жизни школьников: науч. статья. – URL: <https://cyberleninka.ru/article/n/formirovanie-zdorovogo-obraza-zhizni-shkolnikov>

3. Ярлыкова О. В. Формирование здорового образа жизни младших школьников средствами физической культуры: науч. статья. – URL: <https://cyberleninka.ru/article/n/formirovanie-zdorovogo-obraza-zhizni-mladshih-shkolnikov-sredstvami-fizicheskoy-kultury>

4. Сивцева Н. Ф., Григорьева Л. И. Роль семьи в формировании двигательной активности младших школьников // Научно-методический электронный журнал «Концепт». – 2017. – Т. 26. – С. 250–251. – URL: <http://e-koncept.ru/2017/770763.htm>

5. Физическая активность: информационный бюллетень // Всемирная организация здравоохранения: офиц. сайт. – 2024. – URL: <https://www.who.int/ru/news-room/fact-sheets/detail/physical-activity>

6. Гиподинамия у детей // Городская поликлиника № 37: офиц. сайт. – URL: <https://www.37gp.by/informatsiya/shkola-zdorovogo-obraza-zhizni/548-gipodinamiya-u-detej>

7. Двигательная активность школьников // Управление Роспотребнадзора по Калининградской области: офиц. сайт. – URL: <https://39.rospotrebnadzor.ru/content/dvigatelnaya-aktivnost-shkolnikov>

8. Лукманова Н. Б., Малинин А. В., Пухов Д. Н. Физическая активность как детерминанта формирования культуры здорового образа жизни детей школьного возраста: науч. статья. – URL: <https://cyberleninka.ru/article/n/fizicheskaya-aktivnost-kak-determinanta-formirovaniya-kultury-zdorovogo-obraza-zhizni-detey-shkolnogo-vozrasta>

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СОЦИАЛЬНЫЕ ГРУППЫ КАК ФАКТОР ФОРМИРОВАНИЯ ЛИЧНОСТИ И ОБЩЕСТВЕННЫХ ОТНОШЕНИЙ

Аннотация. В данной статье системно анализируются понятие социальной группы, её роль в общественной жизни, механизмы формирования и классификация. Рассматриваются различные типы социальных групп — малые и большие, формальные и неформальные, классифицируемые на основе демографических и психологических критериев. Также анализируется влияние группы на личность и общество, психологические и социологические аспекты социального взаимодействия. В ходе исследования обсуждаются процессы коллективной идентификации, формирование нормативных установок внутри группы и социальная дисциплина.

Ключевые слова: социальная группа, социология, педагогика, психология, классификация, общество, коллективная идентификация, нормативные нормы.

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SOCIAL GROUPS AS A FACTOR IN THE FORMATION OF PERSONALITY AND SOCIAL RELATIONS

Abstract. This article provides a systematic analysis of the concept of social groups, their role in social life, mechanisms of formation, and classification. Various types of social groups are examined, including small and large groups, formal and informal groups, classified on the basis of demographic and psychological criteria. The study also analyzes the influence of social groups on personality development and society, as well as the psychological and sociological aspects of social interaction. Particular attention is paid to the processes of collective identification, the formation of normative attitudes within groups, and social discipline.

Keywords: social group, sociology, pedagogy, psychology, classification, society, collective identification, normative norms.

Человек, живущий в обществе, неизбежно находится в тесной взаимосвязи с социальными группами. Социальные группы, существующие в

структуре общества, становятся неотъемлемой частью повседневной жизни личности, её межличностных отношений и личностного развития. Понятие социальной группы занимает центральное место в социологии и психологии, поскольку именно через группы обеспечивается социальная адаптация личности, формируется её мотивация, процессы принятия решений и способы социального самовыражения. Участвуя в групповой деятельности, индивид не только интегрируется во внешнюю социальную среду, но и соотносит собственное поведение с принятыми социальными нормами.

Социальные группы являются важнейшими элементами социальной структуры общества, посредством которых люди устанавливают взаимодействие, обмениваются знаниями и опытом, формируют социальную идентичность и принимают общие ценности. Группы также играют значительную роль в обеспечении эмоциональной и мотивационной устойчивости личности, формировании системы социальной поддержки. В условиях динамичных социально-экономических изменений группы выступают как институциональный механизм, обеспечивающий связь между личностью и обществом, а также регулирование нормативных установок.

Изучение социальных групп имеет важное значение не только для социологических, но и для психологических и педагогических исследований. Формы внутригруппового общения, социальные нормы, характер взаимодействия между членами группы и механизмы коллективной идентификации позволяют глубже понять процессы принятия решений и поведения личности. С психологической точки зрения участие в группе способствует развитию ответственности, инициативности, лидерских качеств и навыков совместной деятельности.

Социальная группа представляет собой совокупность индивидов, связанных между собой устойчивыми социальными отношениями, общими интересами, целями или идентичностью. К основным характеристикам группы относятся: наличие устойчивых взаимодействий и коммуникации между членами, общие нормы и правила, чувство принадлежности к группе и социальная идентификация, а также групповая динамика.

В теоретическом плане выделяются два основных подхода к пониманию социальной группы: парадигма социальной сплочённости (social cohesion), рассматривающая группу как систему тесных социальных связей и коллективности, и теория социальной идентичности (social identity), согласно которой принадлежность к группе является важной частью самосознания личности. В рамках теории социальной идентичности члены группы воспринимают себя как «мы», противопоставляя себя «другим», что оказывает существенное влияние на формирование группового поведения, норм и социальных воздействий. Таким образом, социальная группа является сложным социально-психологическим феноменом, включающим не только совокупность индивидов, но и систему идентификаций, норм и взаимодействий.

Классификация социальных групп. Социальные группы классифицируются по различным критериям, отражающим их структуру, функции и характер взаимодействия между членами.

По численности и характеру взаимодействия: – малые (первичные) группы — характеризуются тесным, личностным и непосредственным общением между членами (семья, группа друзей, небольшие коллективы); – большие (вторичные) группы — отличаются значительным числом участников и опосредованными формами взаимодействия (профессиональные сообщества, этнические и демографические группы, социальные слои).

По организационной структуре: – формальные группы — имеют чётко определённые цели, структуру и правила, функционируют в рамках организаций и учреждений (учебные группы, трудовые коллективы); – неформальные группы — формируются на основе личных интересов, симпатий и общих увлечений (клубы по интересам, неофициальные сообщества).

По нормативному признаку: – нормативные группы — объединяются на основе общих ценностей, традиций и социальных норм (религиозные, культурные, этнические группы); – референтные группы — служат для личности эталоном поведения и социальной ориентации, на нормы и ценности которых она стремится ориентироваться.

Социальные группы обладают рядом ключевых характеристик: устойчивостью и продолжительностью существования, наличием собственных норм и правил, иерархической структурой и распределением ролей. Эти особенности обеспечивают внутреннюю согласованность группы и эффективность её функционирования.

В условиях стратегического развития общества в 2025 году особое значение приобретает поддержка малых и профессиональных групп, развитие систем наставничества, стимулирование активности членов групп и расширение механизмов социальной поддержки. Это способствует укреплению социальной стабильности и развитию человеческого капитала.

Особое внимание уделяется вовлечению молодёжи и женщин в социальные группы, поддержке их инициатив, а также развитию неформальных и культурных объединений, способствующих инновационному и творческому развитию общества. Усиление взаимодействия между различными группами, снижение социального неравенства и предотвращение конфликтов выступают важными условиями социальной интеграции.

Таким образом, социальные группы являются ключевым элементом общественной структуры, обеспечивающим социальное взаимодействие, поддержку и стабильность. Классификация социальных групп по численности, структуре и целям позволяет глубже понять их функции и значение в современном обществе.

Использованные источники:

1. Андреева Г.М. Социальная психология. — М.: Аспект Пресс, 2020.
2. Гидденс Э. Социология. — М.: Юрайт, 2021.
3. Tajfel H., Turner J.C. An Integrative Theory of Intergroup Conflict // The Social Psychology of Intergroup Relations. — New York: Psychology Press, 2019.
4. Turner J.C. Social Identity and Group Behaviour // Social Science Information. — 2020.
5. Baumeister R.F., Leary M.R. The Need to Belong: Desire for Interpersonal Attachments as a Fundamental Human Motivation // Psychological Bulletin. — 2021.

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ПРИНЦИПЫ И МЕТОДЫ УПРАВЛЕНИЯ ИНВЕСТИЦИЯМИ В ЧЕЛОВЕЧЕСКИЙ КАПИТАЛ В УСЛОВИЯХ ИННОВАЦИОННОГО РАЗВИТИЯ ОРГАНИЗАЦИИ

***Аннотация.** В данной статье рассматриваются особенности принципов и методов управления инвестициями в человеческий капитал в условиях инновационного развития организации, формирования её конкурентоспособности и непрерывного внедрения инноваций, развития системы способных знаний и эффективного управления данной системой.*

***Ключевые слова.** Организация, инновационное развитие, экономика, конкурентоспособность, человеческий капитал, обучение, капитальные вложения, интеллектуальный и творческий потенциал, инвестиции, стратегия, управление, инвестирование.*

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PRINCIPLES AND METHODS OF MANAGING INVESTMENTS IN HUMAN CAPITAL IN THE CONTEXT OF INNOVATIVE DEVELOPMENT OF AN ORGANIZATION

***Abstract.** This article examines the characteristics of the principles and methods of managing investments in human capital in the context of an organization's innovative development, the formation of its competitiveness and continuous innovation, the development of a system of capable knowledge, and the effective management of this system.*

***Keywords.** Organization, innovative development, economy, competitiveness, human capital, learning, capital investments, intellectual and creative potential, investment, strategy, management, capital allocation.*

Основой для формирования эффективных механизмов управления инновационным развитием организации являются принципы управления. Принципы управления — это универсальные правила, основные принципы и стандарты, которым руководители должны следовать для оптимального выполнения поставленных перед ними задач и достижения целей организации. Принципы управления служат объединяющей основой для всех разнообразных инструментов и решений в области кадровой и инвестиционной политики компании, управления знаниями и процессами, и

посредством них осуществляется управление инвестициями в человеческий капитал. Многообразие принципов этой области управления требует систематического (дисциплинарного) подхода к их рассмотрению. Прежде всего, необходимо систематизировать принципы формирования и реализации кадровой политики организации [1, с. 53–55; 2, с. 417–420], поскольку именно в рамках этой политики происходят процессы воспроизводства человеческого капитала.

I. На этапе разработки кадровой политики и формирования системы управления персоналом используются следующие принципы:

- принцип научности и прогресса (учет современных научных подходов и соответствие передовому отечественному и зарубежному опыту);
- принцип индивидуальности (учет факторов внешней и внутренней среды организации);
- принцип зависимости функций управления персоналом от производственных целей (стратегическая ориентация);
- принципы комплексности, многогранности и согласованности (взаимосвязь основных направлений кадровой политики);
- принцип приоритета (первичное развитие наиболее важных элементов);
- принцип перспективности (учет долгосрочных целей и задач);
- принцип гибкости (способность быстро адаптироваться к меняющимся внешним и внутренним условиям);
- принципы простоты, оптимальности и экономичности (выбор наиболее рационального и экономичного варианта политики для данной организации);
- принцип прозрачности (использование понятной терминологии и единой информационной базы).

II. На этапе реализации кадровой политики используются следующие принципы:

- принцип ориентации (методы ориентированы на конкретные категории сотрудников);
- принцип многофакторности (многогранное воздействие на объект управления);
- принцип мотивации (обеспечение заинтересованности сотрудников в эффективном выполнении задач);
- принцип ответственности (личная и коллективная ответственность за неэффективное выполнение функций);
- принципы параллелизма и преемственности (одновременное принятие решений в различных областях управления человеческими ресурсами);
- принцип преемственности (последовательность работы и единообразие методических основ).

Отдельно следует отметить, что принципы формирования системы развития интеллектуального персонала организации имеют большое значение при управлении инвестициями в человеческий капитал. К ним относятся:

- принцип развития на этапе поступления в организацию (в компанию следует вовлекать только тех сотрудников, которые нуждаются в личностном развитии);

- принцип «либо развиваешься, либо уходишь» (сотрудник, прекративший развиваться, не может внести вклад в развитие компании);

- принцип построения внутренней карьерной иерархии на основе критериев профессионального развития;

- принцип создания условий для саморазвития (менеджеры создают стимулы, а сотрудник сам выбирает путь развития).

Поскольку инвестиции в человеческий капитал часто связаны с управлением интеллектуальным капиталом и корпоративными знаниями, важны следующие основные принципы управления знаниями [3]:

Мотивация к обмену знаниями и его оценка. Сотрудники готовы «делиться» знаниями только в том случае, если это необходимо для их успешной работы («производственная необходимость»), если это важно для личностного развития (уважение коллег и т. д.) или если они финансово заинтересованы в этом.

Формирование корпоративной культуры, благоприятствующей управлению знаниями (создание атмосферы доверия и взаимопомощи, создание условий для устного, «спонтанного» обмена знаниями и опытом).

Включение функций управления знаниями в должностные инструкции сотрудников компании.

Обучение «новых сотрудников». Если соответствующая информация включена в их программу адаптации, новые сотрудники воспримут существующую в компании систему управления знаниями как «жесткое правило».

Поскольку инвестирование в человеческий капитал по своей природе является инвестиционным процессом, необходимо взять за основу принципов управления инвестициями. Таким образом, основными принципами разработки инвестиционной стратегии организации являются следующие [4, с. 328]: всесторонность (т. е. всестороннее и целостное освещение рассматриваемых проблем); целенаправленность; Приоритетность поставленных задач; детализация (ясность установленных стратегических целей и направлений их решения); последовательность реализации инвестиционной деятельности; обоснованность, гибкость, осуществимость и эффективность стратегического плана. По мнению В.В. Бочарова, независимо от формы и объекта инвестиций, общие условия инвестиционного успеха, следующие [5, с. 64–67]: сбор и анализ необходимой информации, прогнозирование перспектив рыночной ситуации для объектов, представляющих интерес для инвестора, выбор стратегии поведения на инвестиционном рынке, инвестиционной тактики и, в некоторых случаях,

гибкой текущей корректировки стратегии. Также В.В. Бочаров рекомендует придерживаться следующих правил (принципов) в инвестиционном процессе:

1. Принцип соотношения финансовых сроков («правило золотого банка»), согласно которому получение и расходование средств должны осуществляться в установленные сроки, а инвестиции с длительным сроком окупаемости должны финансироваться за счет долгосрочного заемного финансирования.

2. Принцип сбалансированных рисков, согласно которому необходимо финансировать особенно высоко рискованные инвестиции собственными средствами.

3. Правило предельной рентабельности, согласно которому инвестор должен выбрать тот, который приносит наибольшую прибыль из нескольких альтернативных инвестиционных проектов.

4. Правило, согласно которому чистая прибыль от инвестиций должна быть выше процентных ставок по банковским депозитам.

5. Правило, согласно которому рентабельность инвестиций должна быть выше среднегодового уровня инфляции.

6. Принцип соответствия инвестиционного проекта основной стратегии предприятия на рынке.

Н.М. Абдикеев предложил классифицировать систему принципов управления бизнес-процессами организации на три группы, относящиеся к сфере принятия управленческих решений [6, с. 64]: ценностно-ориентированные принципы; концептуально-организационные принципы; принципы тактического анализа и проектирования. Первые две группы относятся к классу концептуально-стратегических решений, таких как повышение конкурентоспособности компании, ее позиционирование на рынке. Третья группа включает в себя корректировку поведения фирмы в зависимости от реальной ситуации.

В группе ценностно-ориентированных принципов следует выделить следующие основные принципы, определяющие «идеологию и философию» управления инвестициями в человеческий капитал:

1. Принцип приоритета – подразумевает определение организацией приоритетных направлений инвестирования в человеческий капитал и интеграцию соответствующих инвестиционных процессов в ее общую стратегию, стратегию управления человеческими ресурсами и знаниями, а также инвестиционную стратегию;

2. Принцип участия, то есть отношение к сотрудникам как к ценному активу компании, вовлечение их в процессы принятия решений, выявление и развитие их способностей;

3. Принцип систематизации – подразумевает полноту и многогранность управления инвестициями в человеческий капитал на уровне всей организации и ее подразделений, обеспечивая взаимозависимость и взаимодействие между основными направлениями инвестирования в элементы человеческого капитала;

4. Принцип цикличности, то есть управление инвестициями в соответствии с этапами жизненного цикла человеческого капитала и циклом PDCA;

5. Принцип эффективности и результативности, т.е. обеспечение рационального использования инвестиционных ресурсов для достижения инвестиционных целей, сокращение продолжительности инвестиционных процессов, устранение неэффективных и повторяющихся операций.

Группа концептуальных и нормативных принципов (принципов, определяющих основные правила, процедуры и параметры управления инвестициями в человеческий капитал) включает:

1. Принцип обоснованности и адекватности, т.е. использование современных научных подходов, опыта ведущих отечественных и зарубежных компаний, а также необходимой внутренней и внешней информации при управлении инвестициями в человеческий капитал;

2. Принцип цел ориентированности, предусматривающий количественную оценку, реалистичность и достижимость целей инвестиций в человеческий капитал в рамках времени и ресурсов;

3. Принцип гибкости и адаптивности, т.е. индивидуализация системы управления инвестициями в человеческий капитал в каждой организации в зависимости от ее внутренней и внешней среды, а также возможности и необходимости быстрого реагирования на изменения экономической среды, с целью разработки нескольких сценариев управления;

4. Принцип параллелизма и непрерывности, позволяющий организации одновременно выполнять множество управленческих задач, связанных с различными этапами жизненного цикла человеческого капитала;

5. Принцип мотивации, то есть формирование системы мотивации, которая поощряет участие сотрудников в процессах жизненного цикла человеческого капитала, обеспечивая эффективность этих процессов и преодолевая сопротивление изменениям;

6. Принцип прозрачности в управлении инвестициями в человеческий капитал подразумевает, во-первых, разработку и реализацию инвестиционных процессов на единой информационно-методологической основе, и, во-вторых, своевременное и полное информирование об инвестиционной политике организации в области человеческого капитала и обеспечение механизма обратной связи;

7. Принцип ответственности, требующий прямой личной и коллективной ответственности участников процессов жизненного цикла человеческого капитала за неэффективное выполнение возложенных на них функций.

Принципы тактического анализа и проектирования определяют выбор конкретных методов и приемов, используемых при управлении инвестициями в человеческий капитал, исходя из конкретной ситуации. В эту группу входят принципы обеспечения максимальной эффективности и рентабельности инвестиций в человеческий капитал, поддержания баланса рисков и ресурсов

при финансировании инвестиций, а также принципы оценки эффективности инвестиций (с учетом временного фактора и инфляции, сравнение ситуации в организации в условиях «с инвестициями» и «без инвестиций», с учетом всех наиболее важных последствий жизненного цикла человеческого капитала для его различных участников и т. д.).

Использованные источники:

1. Полянский Ю.В., Белый Е.М., Романова И.Б. Инновационный механизм управления государственным вузом. М.: Экономика, 2004. 267 с.
2. Управление организацией: учебник / Под ред. А.Г. Поршнева, З.П. Румянцевой, Н.А. Саломатина. 3-е изд., перераб. и доп. М.: ИНФРА-М, 2003. 716 с.
3. Гейтс Б. Что такое управление знаниями // Бизнес со скоростью мысли / Б. Гейтс. М.: Эксмо, 2007. 477 с.
4. Инвестиционный менеджмент: учебник / Н.Д. Гуськова [и др.]. М.: КНОРУС, 2010. 456 с.
5. Бочаров В.В. Инвестиции (инвестиционный портфель, источники финансирования, выбор стратегии). СПб.: Питер, 2002. 288 с.
6. Реинжиниринг бизнес-процессов / Н. М. Абдикеев [и др.]. М.: Эксмо, 2005. 592 с.
7. Khasanov, A. A. (2017). Methods and methods of forming economic education through interdisciplinary communication through information technology. Journal, (3), 38.
8. Hasanov, A. A., & Gatiyatulina, R. M. (2017). Interdisciplinary Communication as a Didactic Condition of Increasing the Efficiency of Educational Process. Eastern European Scientific Journal
9. Sharipov, D., Abdukadirov, A., Khasanov, A., & Khafizov, O. (2020, November). Mathematical model for optimal siting of the industrial plants. In 2020 International Conference on Information Science and Communications Technologies (ICISCT) (pp. 1-3). IEEE
10. Abdurashidovich, X. A., & Nigmanovna, M. F. (2019). Access to electronic educational resources in the education system. European Journal of Research and Reflection in Educational Sciences Vol, 7(12).
11. Ravshanovna, P. N., & Abdurashidovich, K. A. (2019). Role of innovation in school development. European Journal of Research and Reflection in Educational Sciences Vol, 7(12).
12. Hasanov, A. A. (2020). Peculiarities of preparing teachers for the development and use of elearning resources. Theoretical & Applied Science, (9), 15-17.
13. Khasanov, A. A. (2018). Didactic Foundations of Interdisciplinary Connections at Subject Teaching. Eastern European Scientific Journal, (6).

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МЕТОДЫ ПЕРЕРАБОТКИ НЕФТЯНЫХ УГЛЕВОДОРОДОВ

Аннотация: Вторичная нефтепереработка (вторичные процессы) представляет собой разнообразные процессы переработки нефтепродуктов, полученных методом прямой гонки. Эти процессы сопровождаются деструктивными превращениями содержащихся в нефтепродуктах углеводородов и изменением их природы, то есть являются химическими процессами.

Гидрокрекинг является одним из наиболее экологически чистых процессов нефтепереработки. В комплекс гидрокрекинга, как правило, входят установки очистки газов от сероводорода, регенерации кислых стоков и производства серы (серной кислоты), позволяющие полностью регенерировать и утилизировать технологические отходы.

Важнейшая особенность гидрокрекинга заключается в том, что в нем наряду с реакциями распада тяжелых углеводородов сырья, свойственными крекинг-процессу, протекают реакции гидрирования образовавшихся продуктов распада.

Ключевые слова: деструктив, нефтяные остатки, крекинг, алкан, нафтен, алкены, изомеризация.

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METHODS OF PROCESSING PETROLEUM HYDROCARBONS

Annotation: *Secondary petroleum refining (secondary processes) is a variety of processes for processing petroleum products obtained by the direct race method. These processes are accompanied by destructive transformations of hydrocarbons contained in petroleum products and changes in their nature, that is, they are chemical processes.*

Hydrocracking is considered one of the most environmentally friendly oil refining processes. The hydrocracking complex, as a rule, includes installations for gas purification from hydrogen sulfide, regeneration of acid waste and the production of sulfur (sulfuric acid), allowing for the complete regeneration and disposal of process waste.

The most important feature of hydrocracking is that, along with the decomposition reactions of heavy hydrocarbons of the raw material characteristic of the cracking process, hydrogenation reactions of the resulting decomposition products occur.

Key words: *destructive, oil residues, cracking, alkane, naphthene, alkenes, isomerization.*

Главной особенностью отрасли нефтехимического и основного органического синтеза является многовариантность путей получения одного и того же конечного продукта. При этом могут быть использованы различные источники сырья, в то же самое время один вид сырья может быть использован для получения различных продуктов.

Нефть – уникальное невозполнимое природное богатство. Рациональное использование «черного золота» является важнейшей государственной задачей. Таким образом, необходимо повысить глубину

переработки за счет более полного извлечения топливных фракций из нефти при ее первичной перегонке, подбора наиболее благоприятного состава топливных продуктов (бензин, реактивное топливо, дизельное топливо), а самое главное, за счет развития деструктивных процессов переработки нефтяных остатков с получением ценных топливных и нефтехимических продуктов.

Вторичная нефтепереработка (вторичные процессы) представляет собой разнообразные процессы переработки нефтепродуктов, полученных методом прямой гонки. Эти процессы сопровождаются деструктивными превращениями содержащихся в нефтепродуктах углеводородов и изменением их природы, то есть являются химическими процессами.

Важнейшими из вторичных процессов является термический и каталитический крекинг, риформинг, алкилирование, коксование и гидроочистка нефтепродуктов.

При температуре крекинга в первую очередь деструкции подвергаются алканы и нафтенy преимущественно с высокой молекулярной массой, а наиболее устойчивыми являются ароматические углеводороды и алкены. В результате в продуктах крекинга накапливаются ароматические углеводороды и низшие алкены, которые затем вступают во вторичные реакции полимеризации.

Особую разновидность крекинг-процессов представляет гидрокрекинг, он относится к так называемым гидрогенизационным процессам нефтепереработки. Гидрокрекинг позволит создать оптимальные схемы переработки нефти с максимальным выходом и требуемым ассортиментом моторных топлив.

Гидрокрекинг является одним из наиболее экологически чистых процессов нефтепереработки. В комплекс гидрокрекинга, как правило, входят установки очистки газов от сероводорода, регенерации кислых стоков и производства серы (серной кислоты), позволяющие полностью регенерировать и утилизировать технологические отходы. Топливом для печей служит очищенный от сероводорода собственный газ процесса.

Процесс проводится в среде водорода при высоких температур 260–450 °С и давлении 5–20 МПа, в присутствии бифункциональных катализаторов, катализирующих одновременно реакции расщепления, изомеризации и гидрирования углеводородов.

Гидрокрекинг очень гибкий процесс. Сырьем процесса является тяжелые нефтяные дистилляты, нефтяные остатки (мазут, гудрон), тяжелые и высокосернистые нефти.

Процесс гидрокрекинга остатков имеет в настоящее время два направления: 1) гидрообессеривание мазутов с целью получения маловязкого и малосернистого котельного топлива или сырья для каталитического крекинга; 2) углубленный гидрокрекинг с целью получения дополнительных ресурсов моторных топлив.

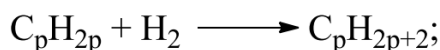
Важнейшая особенность гидрокрекинга заключается в том, что в нем наряду с реакциями распада тяжелых углеводородов сырья, свойственными крекинг-процессу, протекают реакции гидрирования образовавшихся продуктов распада.

Основными реакциями при гидрокрекинге являются:

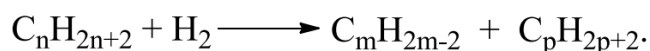
1. Деструкция высокомолекулярных алканов:



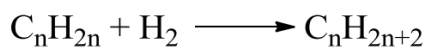
деструкция высокомолекулярных алкенов



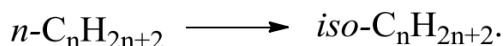
дегидрирование продуктов деструкции:



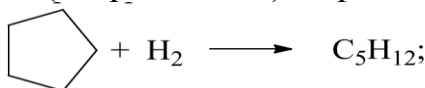
2. Гидрирование алкенов сырья, что в условиях гидрокрекинга термодинамически более вероятно, чем их полимеризация и циклизация:



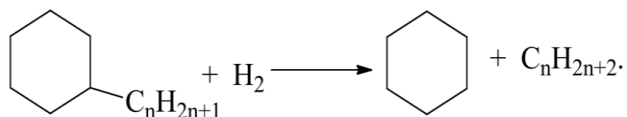
3. Изомеризация алканов:



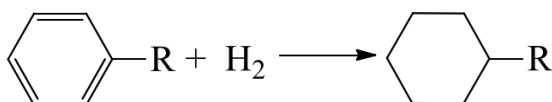
4. Распад, дециклизация (гидрогенолиз) нафтенов, например:



и деалкилирование нафтенов



5. Деалкилирование ароматических углеводородов:



При гидрокрекинге, в отличие от каталитического крекинга, легче всего вступают в превращения ароматические полициклические соединения и образуются с высоким выходом легкие насыщенные углеводороды, в том числе изостроения. При этом одновременно с реакциями углеводородной части сырья, происходит гидрирование и удаление неуглеводородных соединений- гидроочистка нефтепродуктов.

В целом применение гидрокрекинга позволяет повысить глубину нефтепереработки нефти и получить бензин высокого качества, не содержащий сернистых соединений.

Использованные источники:

1. Кукурина О.С. Химия и технология сырья и мономеров: Учебное пособие. Ч.I. Углеводородное сырье. – Томск. 2014. – 104 с.
2. Ахметов С.А. Технология глубокой переработки нефти и газа. – Уфа: "Гилем", 2002. - 671 с.
3. Рябов В.Д. Химия нефти и газа: учебное пособие. – М.: ИД «ФОРУМ», 2009. – 336 с.
4. Эрих В.Н., Расина М.Г., Рудин М.Г. Химия и технология нефти и газа. Изд. 2-е, пер. Л., «Химия», 1977. 424 стр.
5. Рябов В. Д. Термические и каталитические превращения углеводородов и других соединений нефти: учеб. пособие. М.: МИНХ и ГП, 1982.
6. Samadov A.X., Kasimova A.Y., Umedullayev A.G. USE OF GEONAVIGATION SYSTEM IN CONTROLLING AND FAST CONTROL OF HORIZONTAL WELLS' STEM TRAJECTORY // Экономика и социум. 2024. №3-1 (118). URL: <https://cyberleninka.ru/article/n/use-of-geonavigation-system-in-controlling-and-fast-control-of-horizontal-wells-stem-trajectory> (дата обращения: 11.11.2024).
7. Капустин В.М., Гуреев А.А. Технология переработки нефти. В 4-х частях. Часть вторая. Физико-химические процессы. - М.: Химия, 2015. – 400с.
8. Капустин В.М., Рудин М.Г. Химия и технология переработки нефти. – М.: Химия, 2013. – 496с.
9. Samadov A.X., Ashurov Sh.M., Bekmuratov J.A. BURG`ILASH MINORASINI MONTAJ VA DEMONTAJ QILISH TEXNOLOGIYASINI ASOSLASH // Экономика и социум. 2024. №5-1 (120). URL: <https://cyberleninka.ru/article/n/burg-ilash-minorasini-montaj-va-demontaj-qilish-texnologiyasini-asoslash> (дата обращения: 11.11.2024).
10. Nomozov B.Yu., Samadov A.X., Yuldashev J.B., Boyqobilova M.M. ISM TURDAGI QATTIQ QOTISHMALI BURG`ILAR // Экономика и социум. 2023. №9 (112). URL: <https://cyberleninka.ru/article/n/ism-turdagi-qattiq-qotishmali-burg-ilar> (дата обращения: 11.11.2024).

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НЕОЛОГИЗМЫ XXI ВЕКА И ИХ РОЛЬ В РАЗВИТИИ РУССКОГО ЯЗЫКА

Аннотация: В статье рассматриваются неологизмы XXI века как важный элемент развития современной языковой системы русского языка. Анализируются основные источники появления новых слов, включая технологический прогресс, социальные изменения и интернет-коммуникацию. Особое внимание уделяется функциям неологизмов в языке: номинативной, коммуникативной, экспрессивной и социально-идентификационной. Делается вывод о значительной роли неологизмов в обновлении лексического состава русского языка и отражении актуальных реалий современного общества.

Ключевые слова: неологизмы, современный русский язык, лексическая система, заимствования, интернет-коммуникация, языковые изменения.

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NEOLOGISMS OF THE 21ST CENTURY AND THEIR ROLE IN THE DEVELOPMENT OF THE RUSSIAN LANGUAGE

Annotation: The article examines neologisms of the 21st century as an essential component of the development of the modern Russian language system. The study analyzes the main sources of new lexical units, including technological progress, social changes, and Internet communication. Special attention is paid to the functions of neologisms in the language, such as nominative, communicative, expressive, and socio-identificational functions. The article concludes that neologisms play a significant role in renewing the lexical system of the Russian language and in reflecting the realities of contemporary society.

Keywords: neologisms, modern Russian language, lexical system, borrowings, Internet communication, language change

Введение: Язык является живым и постоянно развивающимся явлением, чутко реагирующим на изменения в жизни общества. В XXI веке русский язык испытывает особенно сильное влияние научно-технического прогресса, глобализации и цифровой коммуникации. Эти процессы способствуют активному появлению неологизмов — новых слов и выражений, называющих ранее неизвестные или не имевшие устойчивого языкового обозначения явления. Изучение неологизмов современного русского языка позволяет проследить основные тенденции его развития, а также понять особенности мышления и коммуникации современного общества [1].

Русский язык в XXI веке развивается особенно интенсивно, что связано с процессами глобализации, научно-технического прогресса, цифровизации и изменениями в социальной жизни общества. Одним из наиболее ярких показателей языковых изменений является активное появление неологизмов — новых слов и значений, отражающих современные реалии. Анализ неологизмов позволяет выявить основные тенденции развития лексической системы русского языка и понять механизмы его адаптации к новым условиям.

Современный этап развития русского языка характеризуется высокой степенью лексической динамики, обусловленной социальными, культурными и технологическими трансформациями начала XXI века. Одним из наиболее показательных проявлений данных процессов является активное функционирование неологизмов, отражающих новые реалии общественной жизни и изменения в коммуникативных практиках. Неологизмы выступают важным объектом лингвистического анализа, поскольку позволяют выявить продуктивные словообразовательные модели, основные источники лексических заимствований и механизмы адаптации новых единиц в системе русского языка. Исследование неологической лексики способствует более глубокому пониманию закономерностей языковой эволюции и специфики современного языкового сознания [2; 4].

Материалы и методы исследования: Материалом исследования послужили неологические единицы русского языка XXI века, зафиксированные в современных толковых и специализированных словарях, а также в текстах средств массовой информации, интернет-ресурсов и социальных сетей. В качестве источников языкового материала использовались электронные корпуса текстов, в том числе Национальный корпус русского языка, а также публикации онлайн-СМИ и лексикографические базы данных, отражающие актуальное состояние лексической системы русского языка.

В ходе исследования применялся комплекс лингвистических методов. **Описательный метод** использовался для систематизации и классификации неологизмов по тематическим группам и источникам происхождения. **Словообразовательный анализ** позволил выявить продуктивные модели образования новых лексических единиц. **Семантический анализ** был

направлен на определение особенностей смысловой структуры неологизмов и процессов их переосмысления. Кроме того, применялся **контекстуальный анализ**, обеспечивающий рассмотрение функционирования неологизмов в реальных коммуникативных ситуациях.

Для выявления степени распространённости и закреплённости неологизмов в языковой системе использовались элементы **количественного анализа**, основанные на частотности их употребления в корпусных данных. Комплексный характер применённых методов позволил обеспечить системный и объективный подход к изучению неологической лексики современного русского языка.

Цель статьи: Целью данной статьи является анализ неологизмов XXI века и определение их роли в развитии современного языка. В рамках исследования предполагается выявить основные источники появления неологической лексики, охарактеризовать продуктивные способы её образования, а также рассмотреть процессы адаптации и закрепления неологизмов в языковой системе как отражение социально-культурных и технологических изменений современного общества.

Результаты исследования: В результате проведённого анализа было установлено, что неологизмы XXI века занимают значимое место в лексической системе современного русского языка и отражают основные направления его развития в условиях социально-культурных и технологических изменений. Исследуемый языковой материал свидетельствует о высокой интенсивности процессов неологизации, обусловленных прежде всего цифровизацией коммуникации, глобализацией и изменением форм социальной активности.

Анализ источников происхождения неологизмов показал, что доминирующую роль в пополнении словарного состава играют заимствования, преимущественно из английского языка. Вместе с тем было выявлено активное использование внутренних словообразовательных ресурсов русского языка, что проявляется в высокой продуктивности суффиксальных и префиксальных моделей, а также в образовании глагольных форм от заимствованных основ (например, *лайкать*, *стримить*, *зумиться*) [3].

Словообразовательный анализ позволил выделить наиболее продуктивные модели формирования неологизмов, среди которых преобладают деривационные процессы, основанные на адаптации и морфологической интеграции иноязычных лексических единиц. Семантический анализ показал, что значительная часть неологизмов возникает в результате расширения или переосмысления уже существующих значений, что свидетельствует о семантической гибкости современного русского языка.

Контекстуальный анализ выявил различия в функционировании неологизмов в зависимости от типа дискурса. В текстах средств массовой информации и интернет-коммуникации неологизмы характеризуются

высокой частотностью и широкой вариативностью, тогда как в официально-деловом и научном дискурсах их употребление носит более ограниченный и нормативно обусловленный характер.

Квантитативный анализ показал, что лишь часть неологизмов демонстрирует устойчивую тенденцию к закреплению в языковой системе, тогда как значительное количество лексических новообразований обладает временным, ситуативным характером. Закрепление неологизмов сопровождается их включением в лексикографические источники и постепенной нейтрализацией экспрессивной окраски [1].

Полученные результаты подтверждают, что неологизмы являются важным фактором развития современного русского языка, отражающим как изменения в номинативных потребностях общества, так и общие закономерности языковой эволюции.

Понятие неологизма

В лингвистике под неологизмами понимаются новые слова, словосочетания или значения слов, возникшие в определённый период и воспринимаемые носителями языка как новые. Неологизмы могут быть общезыковыми, закрепляющимися в словарях, и окказиональными, создаваемыми для конкретной речевой ситуации. Со временем часть неологизмов входит в активный словарный состав языка, тогда как другие выходят из употребления.

Понятие неологизма

Неологизмы — это новые слова, словосочетания или новые значения уже существующих слов. Они могут быть:

- **Общезыковыми** — закрепляются в словарях и используются широкой аудиторией.
- **Окказиональными** — создаются для конкретного случая и могут не приживаться в языке.

В современном русском языке наблюдается интенсивный приток как заимствованных, так и исконно русских неологизмов. По происхождению они делятся на:

- **Заимствованные** — пришли из других языков (английский, французский, немецкий).
- **Словообразовательные** — образованы с помощью приставок, суффиксов и композиций (например, *загуглить*, *расшарить*).

Неологизмы не только обозначают новые предметы и явления, но и отражают культурные и социальные изменения.

Основные источники неологизмов XXI века

Появление неологизмов в современном русском языке обусловлено рядом факторов.

1. Технологический прогресс

Развитие информационных технологий и интернета привело к появлению слов: смартфон, блогер, подкаст, стрим, нейросеть. Большинство из них являются заимствованиями, преимущественно из английского языка.

2. Социальные и экономические изменения

Новые формы занятости и общественной активности породили такие слова, как фрилансер, самозанятый, волонтерство, стартап.

3. Интернет-коммуникация и медиа

Социальные сети способствуют быстрому распространению неологизмов, особенно в молодёжной среде: хайп, краш, токсичный, инфлюенсер.

4. Внутренние словообразовательные ресурсы языка

Русский язык активно адаптирует заимствованные слова с помощью суффиксов и приставок: загуглить, заскринить, зумиться, расшарить.

Роль неологизмов в системе русского языка

Неологизмы выполняют важные функции в языковой системе:

- **Номинативная функция** — обозначение новых предметов, явлений и процессов, ранее не имевших названий.
- **Коммуникативная функция** — обеспечение эффективного общения в новых сферах деятельности.
- **Экспрессивная функция** — выражение эмоциональной оценки и субъективного отношения говорящего.
- **Социально-идентификационная функция** — указание на принадлежность к определённой социальной или возрастной группе.

Неологизмы способствуют обновлению лексического состава языка и повышают его выразительные возможности.

Источники неологизмов XXI века

1. Технологический прогресс

Развитие IT и цифровых технологий привело к появлению слов: *смартфон, блогер, стрим, лайк, репост, нейросеть*. Большинство этих слов — заимствования из английского, но русский язык адаптирует их через словообразование (*загуглить, заскринить*) [4].

2. Социальные и экономические изменения

Изменения в обществе и на рынке труда порождают новые термины: *фрилансер, самозанятый, стартап, удалёнка*. Эти слова отражают новые формы занятости и организации жизни.

3. Интернет-коммуникация и медиа

Социальные сети создают уникальные условия для появления и быстрого распространения неологизмов: *хайп, краш, токсичный, инфлюенсер*. Молодёжный язык особенно активно обогащается такими словами.

4. Исконно русские словообразовательные процессы

Русский язык активно использует внутренние ресурсы: приставки, суффиксы, композитные формы. Примеры: *зумиться, расшарить, лайкать, постить*. Эти формы показывают гибкость русской морфологии и способность языка адаптироваться к новым реалиям.

Функции неологизмов

1. Номинативная

Обозначение новых явлений, объектов и процессов: *подкаст, киберспорт, стартап*.

2. Коммуникативная

Обеспечение эффективного общения в новых сферах: Интернет, профессии, хобби.

3. Экспрессивная

Выражение эмоций и субъективного отношения: *токсичный, краш, хайп*.

4. Социально-идентификационная

Отражение принадлежности к социальной, возрастной или профессиональной группе.

Неологизмы часто помогают выделить молодежные субкультуры или профессиональные группы, создавая чувство принадлежности.

Анализ примеров

Закрепление неологизмов в языке

Некоторые неологизмы постепенно входят в активный словарный состав: *смартфон, блогер, стартап*. Другие остаются ограниченными по использованию: *краш, зумиться*. Процесс закрепления зависит от частоты употребления, необходимости обозначения нового явления и культурной значимости.

Основные источники неологизмов

1. Цифровые технологии и интернет

Наиболее продуктивная сфера образования неологизмов — интернет и IT:

- *смартфон*
- *приложение*
- *блогер*
- *стрим / стримить*
- *лайк, дизлайк*

Многие из этих слов являются заимствованиями из английского языка, но быстро адаптируются к русской грамматике.

2. Социальные сети и онлайн-коммуникация

Формируется особый разговорно-сетевой стиль:

- *репост*
- *хейтер*
- *фейк*
- *бан, забанить*
- *краш* (объект симпатии)

Эти слова активно используются молодежью и постепенно проникают в нейтральную речь.

3. Общественно-политическая и социальная сфера

Современная реальность порождает новые понятия:

- *самоизоляция*
- *удалёнка*

- *ковид*
- *локдаун*

Часть таких неологизмов носит временный характер, но некоторые закрепляются в языке.

Способы образования неологизмов

- **Заимствование:** *стартап, фрилансер*
- **Словообразование:** *зумиться, лайкать*
- **Семантическое переосмысление:** *платформа, вирус*
- **Сокращения и аббревиатуры:** *QR-код, ИИ*

Русский язык активно приспосабливает новые слова к своим нормам, что подтверждает его гибкость и жизнеспособность.

Заключение: Неологизмы XXI века являются важным элементом развития современного русского языка. Они отражают изменения, происходящие в обществе, науке и культуре, и демонстрируют гибкость языковой системы. Исследование неологизмов позволяет глубже понять процессы языковой эволюции и актуальные тенденции развития русского языка в условиях современного мира.

Проведённый анализ неологизмов русского языка XXI века позволяет сделать вывод о том, что процессы неологизации являются закономерным и системным явлением, отражающим динамику современного языкового развития. Основными источниками пополнения лексического состава выступают заимствования, преимущественно из английского языка, а также внутренние словообразовательные ресурсы русского языка, реализуемые через деривацию и семантическое переосмысление.

Неологизмы демонстрируют высокую степень адаптации к фонетическим, морфологическим и грамматическим нормам русского языка, что свидетельствует о его способности интегрировать новые языковые единицы без утраты структурной целостности. При этом степень закреплённости неологизмов в языковой системе варьируется: часть из них носит ситуативный характер, тогда как другие переходят в разряд общепотребительной лексики.

Неологическая лексика представляет собой значимый материал для изучения современных языковых процессов, поскольку отражает не только изменения в номинативных потребностях общества, но и общие тенденции эволюции русского языка в условиях глобализации и цифровизации коммуникативного пространства.

Использованные источники:

1. Крысин Л. П. *Лексика современного русского языка*.
2. Земская Е. А. *Словообразование в современном русском языке*.
3. Шмелёв Д. Н. *Русский язык и внеязыковая действительность*.
4. Современные словари неологизмов и материалы интернет-СМИ.

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ГИБКОСТЬ КАДРОВОЙ ПОЛИТИКИ КАК УСЛОВИЕ УСТОЙЧИВОГО РАЗВИТИЯ ОРГАНИЗАЦИИ

***Аннотация:** В статье рассматривается гибкость кадровой политики как одно из условий устойчивого развития организации в современных социально-экономических условиях. Усиление конкуренции, нестабильность внешней среды и изменение требований к персоналу обуславливают необходимость пересмотра традиционных подходов к управлению кадрами. В работе анализируются основные подходы к понятию гибкости кадровой политики, а также направления её реализации в деятельности организаций. Особое внимание уделено практическим инструментам адаптивного управления персоналом, включая использование гибких форм занятости, развитие системы обучения персонала и совершенствование мотивационных механизмов. В результате исследования установлено, что применение гибких кадровых решений способствует повышению адаптивности организации и снижению кадровых рисков, обеспечивая условия для устойчивого развития.*

***Ключевые слова:** Кадровая политика, гибкость кадровой политики, устойчивое развитие организации, управление персоналом, человеческие ресурсы.*

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FLEXIBILITY OF HR POLICY AS A CONDITION FOR SUSTAINABLE DEVELOPMENT OF THE ORGANIZATION

***Abstract.** This article examines the flexibility of HR policies as a prerequisite for sustainable organizational development in today's socioeconomic environment. Increased competition, environmental instability, and changing personnel requirements necessitate a revision of traditional approaches to HR management. The paper analyzes the main approaches to the concept of HR policy flexibility, as well as the areas for its implementation in organizations. Particular attention is paid to practical tools for adaptive HR management, including the use of flexible employment arrangements, the development of personnel training systems, and the improvement of motivational mechanisms. It is concluded that the use of flexible HR*

solutions contributes to increased organizational adaptability and the reduction of HR risks, ensuring the conditions for sustainable development.

Keywords: *HR policy, HR policy flexibility, sustainable organizational development, HR management, human resources.*

В условиях нестабильной социально-экономической среды, ускоренных изменений на рынке труда и роста требований к эффективности управления персоналом возрастает значение кадровой политики организации. Современные организации все чаще сталкиваются с необходимостью оперативной адаптации к внешним и внутренним изменениям, что обуславливает пересмотр традиционных подходов к управлению трудовыми ресурсами. В этих условиях гибкость кадровой политики становится одним из ключевых факторов, обеспечивающих устойчивое развитие организации.

Гибкость кадровой политики предполагает способность организации своевременно реагировать на изменения внешней и внутренней среды, учитывать интересы и потребности персонала, а также корректировать кадровые решения в соответствии со стратегическими целями. От уровня гибкости в сфере управления персоналом во многом зависят устойчивость трудовых отношений, снижение кадровых рисков и сохранение трудового потенциала организации. Вместе с тем на практике многие организации продолжают использовать жёсткие и формализованные кадровые механизмы, что снижает их адаптивность в долгосрочной перспективе.

Актуальность настоящего исследования обусловлена необходимостью формирования и реализации гибкой кадровой политики как условия устойчивого развития организации. В качестве объекта исследования рассматривается кадровая политика организации, а предметом исследования является её гибкость как фактор устойчивого развития. Цель статьи заключается в анализе теоретических подходов к понятию гибкости кадровой политики и выявлении основных направлений её реализации в современных организациях. В рамках исследования предполагается рассмотреть ключевые инструменты гибкой кадровой политики и оценить их роль в обеспечении устойчивости развития организации.

Методы исследования: в ходе исследования были использованы общенаучные методы познания, включая анализ и обобщение научных публикаций по проблемам формирования и реализации кадровой политики. Также применялся сравнительный метод, позволивший сопоставить различные подходы к пониманию гибкости кадровой политики и оценить их влияние на устойчивое развитие организации. В процессе работы использовался системный подход, обеспечивающий комплексное рассмотрение кадровой политики как элемента общей системы управления организацией. Применение указанных методов позволило сформулировать обоснованные выводы и определить основные направления реализации гибкой кадровой политики в деятельности современных организаций.

Результаты исследования

Теоретические подходы к гибкости кадровой политики

Кадровая политика организации представляет собой систему принципов, методов и управленческих решений, направленных на формирование, использование и развитие персонала в соответствии со стратегическими целями организации. Она охватывает вопросы подбора, адаптации, обучения, мотивации и удержания работников, а также формирование условий для эффективного использования трудового потенциала. В современных условиях кадровая политика всё чаще рассматривается не как статичный набор правил, а как динамичный управленческий инструмент, требующий регулярной корректировки.

Понятие гибкости кадровой политики связано со способностью организации адаптировать кадровые решения к изменениям внешней и внутренней среды. К таким изменениям относятся колебания спроса на рынке, трансформация трудовых отношений, развитие цифровых технологий и изменение ожиданий работников. Гибкая кадровая политика предполагает использование различных форм занятости, индивидуальный подход к мотивации персонала, а также готовность к пересмотру внутренних процедур и регламентов.

В современной экономической среде значение гибкости кадровых решений существенно возрастает. Жёсткие и формализованные кадровые механизмы ограничивают возможности организации оперативно реагировать на изменения и повышают уровень кадровых рисков. Напротив, гибкая кадровая политика способствует сохранению ключевых сотрудников, снижению текучести кадров и формированию устойчивых трудовых отношений. В научных исследованиях отмечается, что гибкость не означает отказ от системы управления персоналом, а предполагает её адаптацию к текущим условиям и стратегическим задачам организации.

Особая роль в обеспечении гибкости кадровой политики принадлежит руководству организации. Именно управленческие решения определяют степень открытости к изменениям, готовность к внедрению новых форм работы и подходов к взаимодействию с персоналом. Руководители, ориентированные на развитие и диалог с сотрудниками, способствуют формированию гибкой кадровой среды, основанной на доверии и взаимной ответственности. При этом гибкость кадровой политики должна сочетаться с чётким пониманием стратегических целей и приоритетов развития организации.

Гибкость кадровой политики может рассматриваться как важная характеристика системы управления персоналом, обеспечивающая адаптацию организации к изменениям внешней среды и создающая условия для её устойчивого развития. В результате проведённого анализа установлено, что гибкость кадровой политики является важным условием адаптации организации к изменениям внешней среды. Выявлено, что использование гибких кадровых механизмов способствует снижению текучести персонала, повышению устойчивости трудовых отношений и сохранению ключевых

компетенций персонала. Полученные результаты подтверждают значимость гибкой кадровой политики для обеспечения устойчивого развития организации.

Гибкость кадровой политики в системе устойчивого развития организации

Устойчивое развитие организации предполагает сбалансированное сочетание экономических, социальных и управленческих факторов, обеспечивающих стабильное функционирование и долгосрочное развитие бизнеса. В современных условиях кадровая политика становится одним из ключевых элементов данной системы, поскольку именно персонал обеспечивает реализацию стратегических целей и адаптацию организации к изменениям внешней среды.

Гибкость кадровой политики оказывает непосредственное влияние на экономическую устойчивость организации. Возможность оперативного изменения численности и структуры персонала, перераспределения трудовых ресурсов, а также применения различных форм занятости позволяет снижать издержки и повышать эффективность использования трудового потенциала. В условиях нестабильной конъюнктуры рынка такие решения способствуют сохранению финансовой устойчивости и снижению негативных последствий кризисных явлений.

Социальный аспект устойчивого развития также во многом определяется гибкостью кадровых решений. Учет индивидуальных потребностей работников, возможность совмещения профессиональной деятельности и личной жизни, доступ к обучению и развитию повышают удовлетворённость персонала и уровень его вовлечённости. Гибкая кадровая политика способствует формированию устойчивых трудовых отношений, основанных на доверии и взаимной заинтересованности сторон.

Важным элементом устойчивого развития является управление кадровыми рисками. Недостаточная адаптивность кадровой политики может привести к росту текучести персонала, дефициту квалифицированных специалистов и снижению производительности труда. В этой связи гибкость кадровых решений позволяет своевременно реагировать на изменения в кадровом составе, корректировать мотивационные механизмы и обеспечивать преемственность ключевых функций.

Таким образом, гибкость кадровой политики занимает важное место в системе устойчивого развития организации, обеспечивая баланс экономических и социальных интересов и создавая условия для долгосрочной стабильности и развития бизнеса.

Практические инструменты реализации гибкой кадровой политики

Реализация гибкой кадровой политики в деятельности организации предполагает использование комплекса практических инструментов, направленных на адаптацию системы управления персоналом к изменяющимся условиям внешней и внутренней среды. Выбор конкретных

инструментов зависит от стратегии организации, особенностей отрасли и кадрового потенциала, однако в современных условиях можно выделить ряд наиболее распространённых направлений.

Одним из ключевых инструментов гибкой кадровой политики являются гибкие формы занятости. К ним относятся дистанционная работа, гибкий график рабочего времени, частичная занятость и проектная форма организации труда. Применение таких форм позволяет организациям более эффективно использовать трудовые ресурсы, а также учитывать индивидуальные потребности сотрудников. Для персонала это создаёт условия для повышения удовлетворённости трудом и баланса между профессиональной и личной жизнью, что положительно сказывается на результатах деятельности.

Важное место в системе гибкой кадровой политики занимает развитие персонала. Современные организации всё чаще ориентируются на непрерывное обучение, повышение квалификации и формирование универсальных компетенций работников. Использование внутренних программ обучения, онлайн-курсов и наставничества способствует повышению профессионального уровня сотрудников и их готовности к изменениям. Гибкий подход к развитию персонала позволяет формировать кадровый резерв и обеспечивать устойчивость ключевых бизнес-процессов.

Существенную роль в реализации гибкой кадровой политики играют мотивационные механизмы. В условиях разнообразия потребностей работников возрастает значение индивидуализации системы мотивации, сочетания материальных и нематериальных стимулов. Гибкие системы оплаты труда, программы нематериального поощрения и возможности карьерного развития способствуют удержанию квалифицированных специалистов и снижению текучести кадров.

Практическая реализация гибкой кадровой политики невозможна без формирования соответствующей организационной среды и корпоративной культуры. Открытость к изменениям, поддержка инициатив сотрудников и развитие внутренней коммуникации создают условия для эффективного внедрения гибких кадровых решений. В совокупности перечисленные инструменты позволяют организациям повышать адаптивность и обеспечивать устойчивое развитие в долгосрочной перспективе.

Заключение

В ходе проведённого исследования была рассмотрена гибкость кадровой политики как важное условие долгосрочного развития современной организации. Анализ теоретических подходов показал, что в условиях нестабильной социально-экономической среды и трансформации рынка труда кадровая политика перестаёт быть статичным элементом управления и требует постоянной адаптации к изменениям внешних и внутренних факторов. Гибкость кадровых решений позволяет организациям более эффективно использовать трудовой потенциал, снижать уровень кадровых рисков и обеспечивать устойчивость трудовых отношений.

В работе установлено, что гибкая кадровая политика оказывает комплексное влияние на экономические и социальные аспекты устойчивого развития организации. Использование гибких форм занятости, развитие системы обучения персонала и индивидуализация мотивационных механизмов способствуют повышению адаптивности организации, росту удовлетворённости работников и снижению текучести кадров. Реализация данных инструментов требует формирования соответствующей организационной среды и управленческой готовности к изменениям. Это подтверждает необходимость внедрения гибких подходов к управлению персоналом в практике современных организаций.

Таким образом, гибкость кадровой политики может рассматриваться как один из ключевых факторов обеспечения устойчивого развития организации. Полученные выводы могут быть использованы в практической деятельности при разработке и корректировке кадровой политики, а также послужить основой для дальнейших исследований в области управления персоналом и устойчивого развития организаций.

Практическая значимость исследования заключается в возможности использования полученных выводов при разработке и совершенствовании кадровой политики организаций различных отраслей.

Использованные источники:

1. Армстронг М. Практика управления человеческими ресурсами. — СПб.: Питер, 2019. — 832 с.
2. Веснин В.Р. Управление персоналом: теория и практика. — М.: Проспект, 2020. — 512 с.
3. Десслер Г. Управление персоналом. — М.: Бином, 2018. — 640 с.
4. Кибанов А.Я. Управление персоналом организации. — М.: ИНФРА-М, 2021. — 695 с.
5. Минцберг Г. Стратегический процесс. — СПб.: Питер, 2017. — 560 с.
6. Травин В.В., Дятлов В.А. Кадровая политика и управление персоналом. — М.: Дело, 2019. — 384 с.
7. Международная организация труда. Non-standard employment around the world: Understanding challenges, shaping prospects [Электронный ресурс]. — URL: https://www.ilo.org/global/publications/books/WCMS_534326/lang-en/index.htm (дата обращения: 23.01.2026).
8. World Economic Forum. The Future of Jobs Report 2023 [Electronic resource]. — URL: <https://www.weforum.org/reports/the-future-of-jobs-report-2023> (accessed: 23.01.2026).

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ИСПОЛЬЗОВАНИЕ АСИНХРОННОГО ГЕНЕРАТОРА В МИКРОГИДРОЭЛЕКТРОСТАНЦИЯХ

***Аннотация.** В статье рассмотрены особенности применения асинхронных генераторов в составе автономных микроГЭС. Показано, что использование короткозамкнутого ротора с конденсаторным возбуждением обеспечивает возможность устойчивого режима генерации без внешнего источника реактивной мощности. Разработана математическая модель, учитывающая магнитное насыщение стали статора, а также проведено моделирование в среде MATLAB для анализа характеристик напряжения, момента и энергетической эффективности системы.*

***Ключевые слова:** микроГЭС, асинхронный генератор, магнитное насыщение, реактивная мощность, энергетическая эффективность, стабилизация напряжения.*

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APPLICATION OF AN ASYNCHRONOUS GENERATOR IN MICRO HYDROPOWER PLANTS

***Abstract.** The article discusses the features of using asynchronous generators in autonomous micro hydropower plants. It is shown that the use of a squirrel-cage rotor with capacitor excitation provides a stable generation mode without an external reactive power source. A mathematical model that takes into account the magnetic saturation of the stator steel has been developed, and MATLAB modeling was performed to analyze voltage, torque, and energy efficiency characteristics.*

***Keywords:** Micro hydropower plant, asynchronous generator, magnetic saturation, reactive power, energy efficiency, voltage stabilization.*

Введение

Современное развитие энергетики требует внедрения автономных и возобновляемых источников энергии. Микрогидроэлектростанции (микроГЭС) представляют собой эффективный способ обеспечения удалённых регионов электроэнергией при минимальных затратах и

экологическом воздействии. Асинхронные генераторы занимают особое место в составе микроГЭС благодаря простоте конструкции, надёжности и возможности самовозбуждения.

Теоретические основы использования асинхронных генераторов

Асинхронный генератор с короткозамкнутым ротором способен работать в режиме самовозбуждения при наличии конденсаторной батареи, подключенной к статорной обмотке. При этом создаётся реактивная мощность, необходимая для намагничивания магнитной системы. Важно учитывать влияние магнитного насыщения стали статора, так как оно определяет стабильность напряжения и форму выходного сигнала.

Математическое моделирование и расчёт статических режимов

Для описания работы асинхронного генератора использована система уравнений в dq-координатах, где параметры машины зависят от коэффициента магнитного насыщения. Разработан алгоритм расчёта статического режима с учётом изменения активной и реактивной составляющих тока. Моделирование проводилось в MATLAB/Simulink, где исследованы зависимости напряжения и момента от нагрузки.

Результаты моделирования и экспериментальные исследования

Результаты численного моделирования показали, что применение учёта магнитного насыщения позволяет точнее определить напряжение холостого хода и под нагрузкой. Для практической реализации использован контроллер Arduino Mega с PID-регулятором, стабилизирующим напряжение на выходе. Экспериментальные испытания, проведённые на установке мощностью 0,75 кВт в составе микроГЭС фермерского хозяйства «AGRO PRODSTAR», подтвердили снижение колебаний напряжения на 5–7% и повышение коэффициента мощности до 0,9.

Заключение

Исследование показало, что использование асинхронного генератора с конденсаторным возбуждением в автономных микроГЭС является эффективным решением для энергоснабжения сельских и удалённых регионов. Разработанная модель может быть применена для оптимизации параметров генератора и системы управления. В дальнейшем планируется внедрение адаптивных методов регулирования на основе искусственного интеллекта для повышения стабильности генерации.

Использованные источники:

1. N. Pirmatov, S. Mahamadjonov, M. Matqosimov and H. Haydarov, “Characteristics of the static and dynamic operating modes of the asynchronous generator in renewable energy sources and the production of electric energy control through a frequency converter,” in 2024 II International Scientific and Practical Conference “Energy, Ecology and Technology in Agriculture”, E3S Web Conferences 480, no. 01007, <https://doi.org/10.1051/e3sconf/202448001007>
2. Ahmedov, A. P., Mahamadjonov, S. Y. O. Modeling of magnetic saturation in autonomous asynchronous generators for micro hydropower plants. Andijan State Technical Institute Bulletin, 2023, №2(48), pp. 45–56.

3. Work Of Asynchronous Generator In The Composition Of Mini-Ges In Autonomous Mode SYU Mahamadjonov - The American Journal of Engineering and Technology, 2021
4. С Ю Махамаджонов ИСПОЛЬЗОВАНИЕ АСИНХРОННОГО ГЕНЕРАТОРА В МИКРОГИДРОЭЛЕКТРОСТАНЦИЯХ - Экономика и социум, 2025
5. S Makhamadjonov Modeling and characterization of operating modes of a self-excited induction generator for micro-hydropower applications - Engineer, 2025
6. Efficient use of the asynchronous generator of micro hpp. N B Pirmatov, MM Matqosimov, SY Mahamadjonov - scientific and technical journal machine building, 2022

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ЗАКОНОМЕРНОСТЬ ПОВЕРХНОСТНЫХ ВОДНЫХ ПОТОКОВ В ДЕЛЬТОВЫХ ГЕОСИСТЕМАХ

Аннотация: В статье раскрываются общие географические закономерности стока в малких дельтах и коллекторных бассейнах. “Древовидная” структура стока и “бассейновая” структура стока связаны с внутренним строением объектов, и структура рельефа играет в этой связи ключевую роль. Кроме того, научно обоснована важность двух групп структуры стока в определении геохимического режима ландшафтов.

Ключевые слова: мелкие дельта, почва, поверхностный сток воды, структура бассейна, структура деревьев, Высота и глубина рельефа.

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PATTERNS OF SURFACE WATER FLOWS IN DELTA GEOSYSTEMS

Abstract: The article reveals the general geographic patterns of runoff in small deltas and collector basins. The “treelike” structure and the “basin” structure of runoff are related to the internal structure of objects, and the relief structure plays a key role in this connection. In addition, the importance of two groups of runoff structure in determining the geochemical regime of landscapes has been scientifically substantiated.

Key words: shallow deltas, soil, surface water runoff, basin structure, tree structure, elevation and depression.

Для всестороннего анализа каждого объекта большое внимание изначально уделяется истории его происхождения. Поэтому изучение происхождения дельт и их специфических природно-географических законов всегда привлекало естествоиспытателей. В.М. Боровский, основываясь на своих научных исследованиях в дельте Сырдарьи в 1942-1945 годах, разработал доктрину «целостности литоморфогенезисных процессов» в дельте. Эта доктрина нашла отражение в его монографии «Древняя дельта Сырдарьи и Северного Кызылкума», написанной в сотрудничестве с М.А.Погребинским в 1958 году. Научное понятие литоморфогенезиса впервые было использовано в научной литературе в 1947 году. Анализ

закономерностей почвообразования в дельте — чрезвычайно сложная задача. Формирование почв в дельте зависит прежде всего от наносов, принесенных рекой, и их механического состава. Именно поэтому в вертикальном и горизонтальном направлениях почв резко проявляются очень большие литологические различия. При этом большинство почв в дельте являются гидроморфными, а некоторые имеют реликтовую гидроморфную природу. Дальнейшее развитие сформировавшихся почв связано с расположенными поблизости грунтовыми водами. В почвенных горизонтах всегда преобладает вертикальный тип водо- и солевого обмена. Наличие большого количества солей в составе грунтовых вод, в свою очередь, напрямую влияет на водо-солевой режим почв. Очень сложно выделить генетические горизонты, выделенные В.В. Докучаевым, в почвенных горизонтах дельты.

При изучении специфических почв дельты исследователи уделяли внимание морфологическим характеристикам выбранных почв и почвообразующим факторам. В результате исследований В.М. Боровского в дельте Сырдарьи идея естественной взаимосвязи почвообразующих процессов нашла отражение в доктрине единства литоморфопедеогенеза в дельте. Главной задачей этих исследований является изучение динамики и структуры литоморфопедеогенеза. Этот метод ранее не применялся в мелиорации земель, и исследования проводились с точки зрения изучения природных систем.

В дельтовых условиях русло реки разветвляется на множество ветвей, в результате чего происходит отложение иловых пород и непрерывное поднятие русла. Образовавшиеся возвышенности начинают доминировать над территориями, окружающими русло, то есть состояние окружающих низменностей напрямую зависит от возвышенностей, окружающих русло. В результате образования естественных дюн вокруг русла реки формируются береговые возвышенности и межречные низменности. В годы с большим количеством воды в руслах рек происходит обрушение берегов и перелив воды. В результате изменений поверхностных вод отложения разделяются на различные группы, то есть происходит пространственная стратификация аллювиальных отложений. В то время как на берегах накапливаются крупные пески и суглинки, в межбереговых низинах скапливаются мелкие иловые отложения. Перелив паводковых вод приводит к изменению направления многих ветвей дельты. Высыхание старых слоев и образование новых приводят к захоронению прежних литологическо-морфологических комплексов, то есть под новыми слоями находятся ранее сформированные отложения. Все эти процессы затрудняют изучение литоморфогенетических закономерностей дельты.

В дельтах, при близости грунтовых вод, развиваются преимущественно гидроморфные почвы (луговые и болотистые). Формирование луговых почв тесно связано с возникновением наводнений и наличием поблизости пресных грунтовых вод. Процессы формирования луговых почв происходят на возвышенностях русла. Наводнения играют ключевую роль в формировании

болотистых почв. Таким образом, формирование, развитие и пространственная стратификация почв в дельтах происходят в связи с процессом литоморфопедеогенеза. Поэтому этот процесс называется литоморфопедеогенезом. Иными словами, формирование, развитие и пространственная стратификация почв в дельтах зависят от отложений, принесенных дельтовыми сетями, и их географического распределения относительно рельефа.

Учение о целостности литоморфопедеогенеза в дельтах принадлежит академику В.М.Боровскому. Развитие этого учения в естественной географии связано с именем М.Ш.Ишанкулова. По мнению учёного, процесс литоморфопедеогенеза широко распространён в природе и характерен для всех аккумулятивных ландшафтов. При изучении целостности процесса литоморфопедеогенеза в дельте методом пластичности рельефа мы уделяли большое внимание естественно-географическим факторам формирования ландшафта, а именно, в частности, потоку поверхностных вод. Процесс литоморфопедеогенеза в дельте напрямую зависит от динамики потока поверхностных вод. Как известно, в своей теоретической статье «Роль географических факторов в формировании географических комплексов», опубликованной в 1948 году, С.Д.Муравейский научно обосновал, что третий географический фактор — поверхностный водоток — играет в формировании ландшафта ту же роль, что и климат и рельеф, то есть древовидная структура дельтового рельефа, сформированного в результате поверхностного водотока, резко отличается от других типов ландшафтов. При этом С.Д.Муравейский, уделяя большое внимание поверхностному водотоку, приходит к следующему выводу: «Без переноса, без миграции не может быть движения, не может быть взаимодействия, никакого взаимодействия. Эта важная роль переноса, движения веществ на поверхности Земли, ложится прежде всего и главным образом на процесс поверхностного водотока».

С.Д.Муравейский (1948) первым теоретически обосновал роль поверхностных водотоков в формировании ландшафтов. Малые дельты, образовавшиеся в процессе дельтообразования, имеют «древовидную» структуру, которая определяет структуру поверхностных водотоков на неорошаемых в настоящее время территориях. На орошаемых территориях имеются водосборные бассейны, и структура поверхностных водотоков в них уникальна.

В заключение можно сказать, что:

1. Мелькие дельты, образованные в результате активности поверхностных водотоков в дельтовых условиях, в настоящее время формируют «древовидную» структуру поверхностных водотоков в объектах.

2. Поверхностные водотоки, вызывающие взаимосвязь мельких дельт в коллекторных бассейнах, определяют «бассейновую» структуру.

3. Поскольку поверхностные водотоки в малых дельтах движутся с их высоких высот к сверхводному элементарному ландшафту по обеим сторонам, условия мелиорации и механический состав почв, химический

уровень грунтовых вод и геохимический режим ландшафтов систематически изменяются в одном направлении.

4. В коллекторных бассейнах поверхностный поток воды движется от границы бассейна в направлении прохождения самого коллектора, и качество природных компонентов изменяется в том же направлении.

5. «Древовидная» структура поверхностных потоков воды в неорошаемых районах современной дельты Амударьи и «бассейновая» структура в орошаемых районах являются общей географической структурой, характерной для всех дельтовых геосистем Центральной Азии.

6. Главным фактором формирования этих двух структур поверхностных потоков воды, существующих в дельтовых условиях, является пластика рельефа. Поскольку структура поверхностных потоков воды всегда требует взаимодействия рельефа с водными потоками, форма рельефа напрямую влияет на их структуру.

Использованные источники:

- 1.Боровский В.М., Погребинский П.А. Древняя дельта Сирдари и Северные Кизилкуми. - Алма-Ата: Изд-во АН КазССР, 1958. - Т. II. 516 с.
- 2.Егоров В.В. Почвообразование и условия проведения оросительных мелиораций в дельтах Арало-Каспийской низменности. -М.: Изд-во АН СССР, 1959. – 296 с.
- 3.Муравейский С.Д. Роль географических факторов в формировании географических комплексов// Вопр. Геогр.-М.: Мысль, 1948.- Сб.9.-С 95-110.
- 4.Ishankulov M.Sh. Pochvenno-meliorativnoye ucheniye o yedinstve protsessov lito-morfo-pedogeneza v deltax i yego geograficheskaya sushnost // Probl. osvoyeniya pustin. -1979. - №5 S. 3-17.
- 5.Ibroimov Sh.I. Amudaryo hozirgi deltasining daraxtsimon va paragenetik landshaft komplekslari. Geografiya fanlari bo'yicha falsafa doktori diss. Avtoreferat Samarqand. 2023. 40 bet.
- 6.Urazbayev A.K., Xursanov D.B. Amudaryo hozirgi deltasi landshaftlarining strukturasi. – Samarqand. 2020. -138 b.
- 7.Уразбаев А.К. Кичик дельталарнинг дарахтсимон ландшафт комплекслари // Доклады Академии наук РУз. 2021.№4.С.90-92.

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РАННЯЯ НЕЙРОПСИХОЛОГИЧЕСКАЯ ДИАГНОСТИКА И ИНТЕРВЕНЦИЯ У ДЕТЕЙ ИЗ ГРУПП ГЕНЕТИЧЕСКОГО РИСКА, РОЖДЁННЫХ В УСЛОВИЯХ БЛИЗКОРОДСТВЕННОГО БРАКА

***Резюме:** Проблема ранней диагностики и коррекции психического развития у детей, рождённых в результате близкородственных браков, представляет собой актуальное направление клинической нейропсихологии и детской психиатрии. Высокий уровень генетической отягощённости, связанный с консангвинностью, значительно повышает риск формирования первичных и вторичных нарушений нейропсихологического развития. К числу типичных отклонений относятся задержки речевого развития, снижение темпов формирования когнитивных функций, дефицит исполнительного контроля и трудности в эмоционально-поведенческой сфере.*

Настоящее исследование было направлено на выявление ранних нейропсихологических маркеров у детей дошкольного возраста из групп генетического риска и оценку эффективности комплексной коррекционной программы. В выборку вошли 72 ребёнка (42 мальчика и 30 девочек) в возрасте от 2 до 5 лет, рождённых в семьях, где родители находятся в родственных отношениях первой степени (двоюродные или родные брат/сестра). Все дети проживали в сельских или пригородных районах, где социальные и образовательные ресурсы были ограничены.

Для диагностики использовались адаптированные методики оценки психического развития, включая нейропсихологические пробы (по А.Р. Лурия и Т.В. Ахутина), поведенческие шкалы (CBCL) и родительские анкеты. Особое внимание уделялось развитию сенсомоторных функций, слухового и зрительного восприятия, памяти, речи, а также навыков регуляции поведения.

Результаты исследования показали, что более 65% детей имели выраженные признаки нейропсихологического дефицита: у 41% — умеренная задержка речевого развития, у 36% — трудности в сенсомоторной координации, у 28% — эмоциональная неустойчивость и импульсивность. После прохождения 6-месячной коррекционной программы, включающей логопедические занятия, сенсомоторную стимуляцию, элементы

когнитивной тренировки и родительское консультирование, у большинства детей наблюдалось улучшение в сфере коммуникации, повышения уровня внимания и поведения.

Выводы исследования подтверждают, что ранняя нейropsychологическая диагностика и интервенция у детей из групп с повышенным генетическим риском являются необходимыми условиями для снижения вероятности развития стойких нарушений. Полученные результаты могут использоваться при разработке программ раннего вмешательства в регионах с высокой долей близкородственных браков.

Ключевые слова: нейropsychологическая диагностика, генетический риск, близкородственный брак, дети дошкольного возраста, когнитивная коррекция, раннее вмешательство.

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EARLY NEUROPSYCHOLOGICAL DIAGNOSIS AND INTERVENTION IN CHILDREN AT GENETIC RISK BORN FROM CONSANGUINEOUS MARRIAGES

Resume: The issue of early diagnosis and intervention in the neuropsychological development of children born from consanguineous marriages is an urgent topic in clinical neuropsychology and child psychiatry. High genetic burden associated with consanguinity increases the risk of primary and secondary developmental delays. Typical deviations include delayed speech, reduced cognitive development, executive dysfunction, and behavioral and emotional instability.

This study aimed to identify early neuropsychological markers in preschool children from genetically at-risk families and evaluate the effectiveness of a corrective intervention program. The sample included 72 children (42 boys, 30 girls) aged 2 to 5 years, born to first-degree relatives (siblings or cousins). All participants lived in rural or peri-urban areas with limited access to early education and healthcare services.

The diagnostic toolkit included neuropsychological tasks (based on Luria and Akhutina), behavioral rating scales (CBCL), and structured parental interviews. Areas of focus included sensorimotor coordination, auditory and visual perception, memory, speech development, and behavioral regulation.

Findings revealed that over 65% of children showed signs of neuropsychological underdevelopment: 41% had moderate speech delay, 36% had sensorimotor difficulties, and 28% exhibited emotional lability and impulsivity. After a 6-month intervention program that included speech therapy, sensorimotor exercises, cognitive training elements, and parent consultations, most children showed improvements in communication, attention span, and behavior.

The study concludes that early neuropsychological screening and targeted intervention in genetically vulnerable groups are essential for preventing persistent developmental disorders. These results may inform regional early-intervention programs, especially in areas with a high incidence of consanguineous marriage.

Keywords: *neuropsychological diagnosis, genetic risk, consanguinity, preschool children, cognitive intervention, early intervention.*

Актуальность. Близкородственные (инбридные) браки увеличивают риск рождения детей с врождёнными генетическими и нейropsychическими нарушениями. При кровнородственном родстве первого порядка (например, брак между двоюродными братом и сестрой) существенно возрастает вероятность аутосомно-рецессивной передачи заболеваний [6]. Наряду с соматическими и неврологическими патологиями, у этих детей чаще наблюдаются задержки речевого, когнитивного и эмоционального развития, а также более высокий риск аутистических спектров и интеллектуальной недостаточности [8].

В условиях нарастания социально-генетических рисков, особенно в регионах с высокой частотой инбридных браков, крайне важна ранняя диагностика и коррекционная помощь детям с отягощённой наследственностью.

Современные исследования в области детской нейропсихологии и медицинской генетики свидетельствуют о растущем числе детей с нарушениями психоразвития, особенно в регионах с высокой распространённостью близкородственных (консангинных) браков [8,12]. Консангинность значительно увеличивает риск аутосомно-рецессивных заболеваний и разнообразных когнитивных и поведенческих нарушений вследствие повышения гомозиготности по ряду патологических аллелей [4,7].

Особую обеспокоенность вызывает тот факт, что нарушения психического развития в условиях генетической отягощённости часто проявляются на самых ранних этапах онтогенеза, но остаются недиагностированными до поступления ребёнка в образовательные учреждения [5]. Это связано как с ограниченным доступом к специализированной диагностике в регионах с высоким уровнем родственных браков, так и с низкой осведомлённостью родителей и педиатров о значении раннего выявления таких отклонений [2,6].

К числу наиболее распространённых нарушений у детей из консангинных браков относятся задержки речевого и моторного развития, эмоциональная дисрегуляция, проблемы с формированием произвольности, а

также устойчивые трудности в обучении и социализации [7,8]. В этих условиях нейропсихологическая диагностика, основанная на концепциях А.Р. Лурия, А.Н. Леонтьева и их последователей, становится одним из наиболее информативных и доступных инструментов оценки функционального состояния мозга ребёнка [11].

Также важно подчеркнуть необходимость раннего вмешательства, направленного на активацию незрелых или дефицитарных звеньев когнитивной деятельности, стимуляцию сенсомоторного и речевого развития, коррекцию поведенческих проявлений и обучение родителей методам сопровождения [9]. Эффективность таких интервенционных программ подтверждается международными и отечественными исследованиями, особенно при включении в коррекцию мультидисциплинарной команды (психолог, логопед, дефектолог, педиатр) [1].

Таким образом, комплексный подход, включающий скрининг в раннем возрасте, нейропсихологическую диагностику и своевременную интервенцию, является ключевым условием предупреждения тяжёлых форм задержки развития и вторичных психических нарушений у детей из групп генетического риска [13].

Цель работы. Определить особенности нейропсихологического развития у детей дошкольного возраста, рождённых в условиях близкородственного брака, и оценить эффективность ранней коррекционной интервенции, направленной на минимизацию когнитивных и поведенческих нарушений, связанных с генетической отягощённостью.

Материалы и методы исследования. В рамках исследования были обследованы 50 детей в возрасте от 6 месяцев до 5 лет, рождённых в семьях, где родители являются близкими родственниками (двоюродные брат и сестра, дядя и племянница и т.д.). Основная цель — выявить, как часто у таких детей встречаются отклонения в психическом развитии и насколько эффективно можно помочь им с помощью ранней коррекции.

Все дети наблюдались в условиях детского психоневрологического центра и дошкольных учреждений с коррекционными группами. Обследование проводилось в течение одного года.

Результаты исследования. В исследовании приняли участие 72 детей в возрасте от 6 месяцев до 5 лет, рождённых в семьях, где родители являются близкими родственниками. В исследование были включены 72 ребёнка в возрасте от 2 до 5 лет, рождённые в семьях с близкородственным браком (первая степень родства: двоюродные и родные братья/сёстры). Из них 42 ребёнка составляли мальчики (58,3%) и 30 — девочки (41,7%). Все дети проживали в сельской местности, где отсутствовали доступные специализированные центры ранней психолого-педагогической помощи. Отбор проводился на основании родительского информированного согласия и предварительного неврологического скрининга.

На первом этапе исследования была проведена углублённая нейропсихологическая диагностика с применением комплекса методик, адаптированных под дошкольный возраст. В неё входили:

- задания на зрительно-пространственный гнозис и конструктивный праксис,
- тесты на слуховое восприятие и речевую память,
- задания на зрительно-моторную координацию,
- наблюдение за регуляторным поведением, инициативностью и эмоциональной реактивностью.

Кроме того, использовалась родительская анкета и поведенческая шкала CBCL (Child Behavior Checklist).

Анализ данных выявил, что:

У 49 детей (68%) были отмечены отклонения от нормы по нескольким функциональным сферам.

У 30 детей (41,6%) диагностирована задержка речевого развития (пониженный словарный запас, бедность фразовой речи, затруднение артикуляции).

У 26 детей (36,1%) наблюдалась несформированность зрительно-пространственного восприятия и трудности с анализом объектов по признакам.

Диаграмма 1.

Структура нейропсихологических нарушений у детей из групп генетического риска.

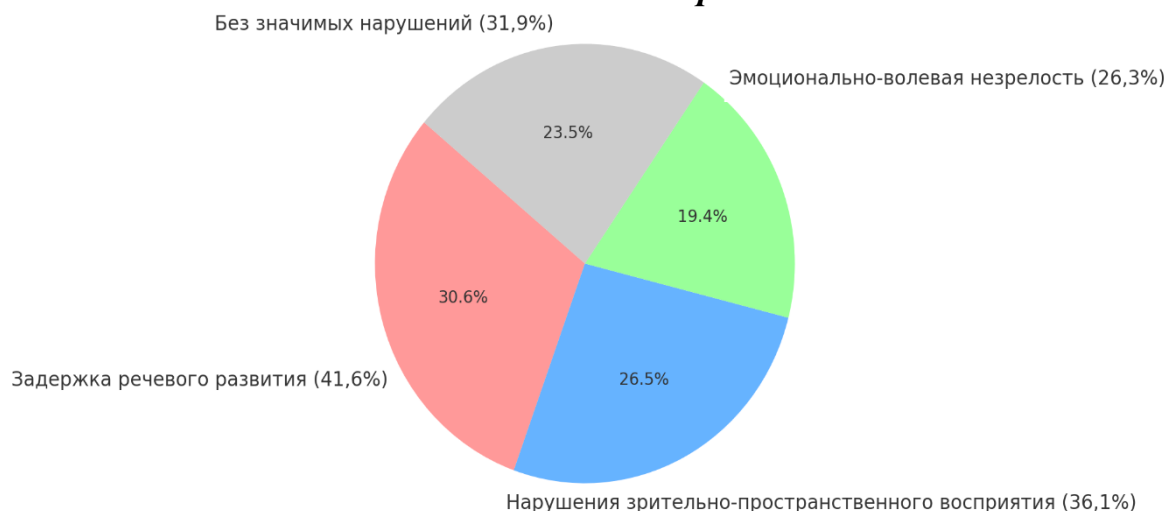


Диаграмма отражает распределение основных видов нарушений, выявленных в ходе первичной нейропсихологической диагностики у детей дошкольного возраста, рождённых в условиях близкородственного брака. Наиболее распространёнными отклонениями оказались задержка речевого развития, нарушения зрительно-пространственного восприятия и эмоционально-волевая незрелость.

Эмоционально-волевая незрелость и импульсивное поведение были зафиксированы у 19 детей (26,3%).

Только у 23 детей (31,9%) не было выявлено значимых отклонений по результатам нейропсихологического тестирования, однако у них также были отдельные признаки сенсомоторной незрелости.

Диаграмма 2.
Положительная динамика после коррекционной программы

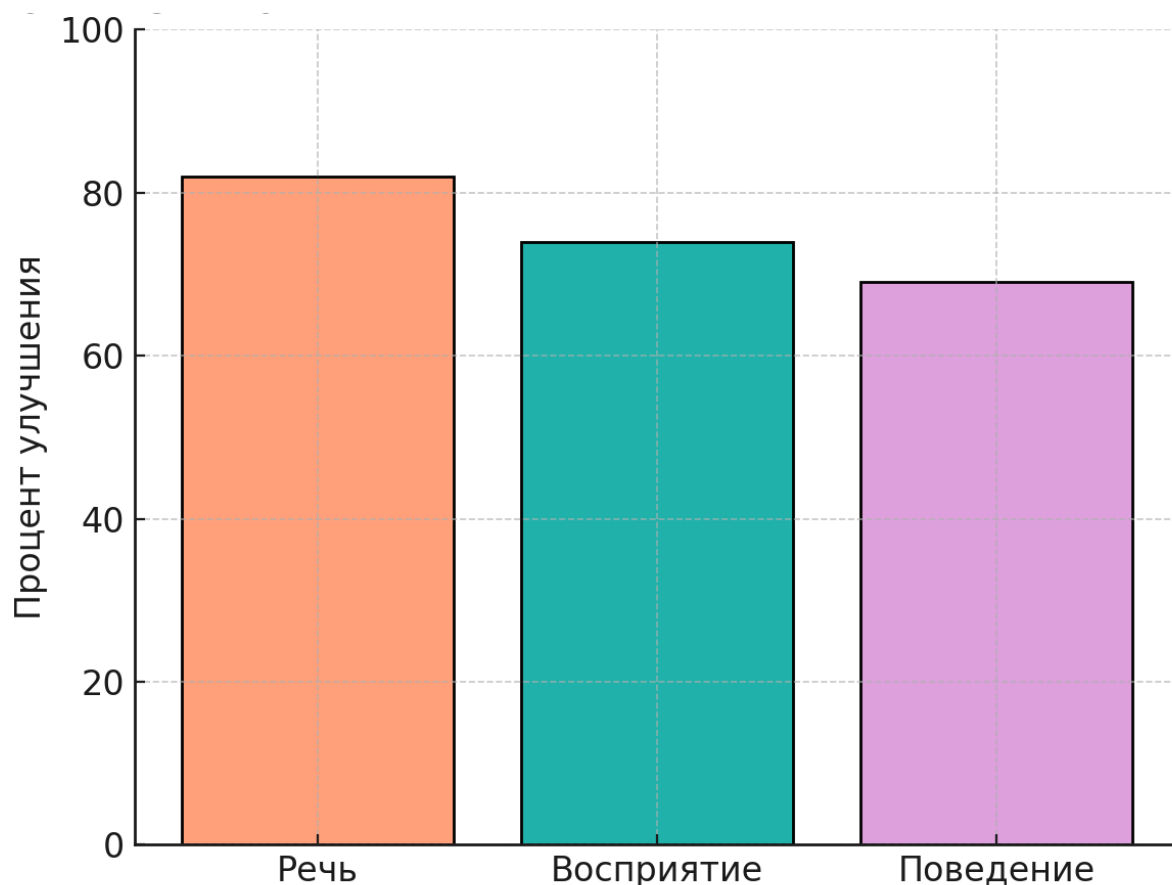


Диаграмма демонстрирует степень улучшения у детей дошкольного возраста с нейропсихологическими нарушениями после прохождения 6-месячной комплексной интервенции. Наиболее выраженная положительная динамика зафиксирована в области развития речи (82%), восприятия (74%) и регуляции поведения (69%).

На втором этапе 39 детей с наиболее выраженными нарушениями были включены в коррекционную интервенционную программу, продолжавшуюся 6 месяцев. В неё входили:

- индивидуальные логопедические занятия (2 раза в неделю),
- элементы сенсомоторной коррекции (развитие мелкой моторики, баланс, пространственные ориентировки),
- когнитивные игры на развитие внимания и памяти,
- родительское консультирование и домашние упражнения.

Контрольная группа (n = 33) получала только базовые наблюдения педиатра и рекомендации по уходу.

По завершении программы была проведена повторная нейропсихологическая диагностика. Результаты показали значимые улучшения в экспериментальной группе:

У 82% детей наблюдался рост речевой активности, формирование элементарных диалогов, увеличение словарного запаса.

У 74% — улучшение внимания и слухового восприятия, снижение количества ошибок при воспроизведении заданий.

У 69% — положительная динамика в поведенческой регуляции (уменьшение импульсивности, появление навыков следовать инструкциям).

Родители отмечали повышение контактности, снижение тревожности и более устойчивое настроение у своих детей.

Контрольная группа не показала достоверной положительной динамики по большинству показателей, что свидетельствует о критической необходимости раннего вмешательства, особенно в условиях генетического риска.

Таким образом, результаты исследования подтверждают, что у детей, рождённых в результате близкородственных браков, существенно повышена вероятность нейропсихологических нарушений. Эти дети нуждаются в систематической диагностике с раннего возраста и в многоуровневой коррекционной помощи, адаптированной под их возрастные и когнитивные особенности.

Полученные данные подчёркивают не только клинико-психологическую, но и социально-профилактическую значимость программы раннего вмешательства. Предложенный алгоритм может быть внедрён в практику работы районных психолого-медико-педагогических комиссий, детских поликлиник и центров раннего развития в регионах с высоким уровнем консангвинных браков.

Вывод. Дети, рождённые в близкородственных браках, действительно имеют более высокий риск задержек психического развития. Однако при своевременном выявлении проблем и раннем вмешательстве (коррекционные занятия, поддержка семьи) — можно добиться значительного прогресса. Чем раньше начата помощь, тем выше шансы на нормализацию развития и адаптацию ребёнка к жизни и обществу.

Использованные источники:

1. Абрамова Г.С. Возрастная психология: Учебник для вузов. — М.: Академический проект, 2020. — 416 с.
2. Ахмедова С.А., Юсупова Г.Р. Генетически обусловленные формы задержки психоразвития у детей. // Педиатрия и детская неврология, 2021. — № 4. — С. 23–28.
3. Вассерман Л.И., Бурлачук Л.Ф. Психодиагностика в клинике и практике развития. — СПб.: Речь, 2019. — 304 с.

4. Ганиев Ф.К. Неврологические аспекты раннего детского развития. // Неврология и нейропсихиатрия, 2022. — № 2(36). — С. 41–45.
5. Ермолаева М.В. Нарушения речевого развития в условиях наследственной патологии. — М.: Логос, 2018. — 280 с.
6. Журавлёва И.В. Влияние генетических факторов на формирование когнитивной сферы у детей. // Медико-социальные аспекты здоровья детей, 2020. — № 1. — С. 14–19.
7. Коновалова И.А., Саидова Д.М. Этапы и подходы к нейропсихологической коррекции дошкольников. // Детская клиническая психология, 2021. — № 3. — С. 59–65.
8. Савина Е.А. Междисциплинарный подход к ранней помощи детям с нарушениями развития. // Дошкольная педагогика, 2021. — № 5. — С. 8–12.
9. Bittles A.H. Consanguinity and its relevance to clinical genetics. // Clinical Genetics, 2001. — Vol. 60(2). — P. 89–98.
10. Bunday S., Alam H. Risk of genetic disorders in the offspring of consanguineous marriages. // Journal of Medical Genetics, 1993. — Vol. 30. — P. 113–116.
11. Luria A.R. The Working Brain: An Introduction to Neuropsychology. — New York: Basic Books, 1973. — 400 p.
12. Mervis C.B., Klein-Tasman B.P. Early intervention for children with genetic syndromes. // Developmental Disabilities Research Reviews, 2015. — Vol. 21(1). — P. 48–54.
13. World Health Organization (WHO). Early Childhood Development and Disability: A Discussion Paper. — Geneva: WHO, 2012. — 36 p.

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ГИПЕРТОНИЧЕСКАЯ БОЛЕЗНЬ И ПРЕЭКЛАМПСИЯ: КЛИНИКО-ПАТОГЕНЕТИЧЕСКИЕ ВЗАИМОСВЯЗИ

Аннотация: Гипертоническая болезнь (ГБ) и преэклампсия (ПЭ) являются распространёнными патологическими состояниями, сопровождающимися повышением артериального давления и поражением органов-мишеней. Целью работы явилось изучение взаимосвязи между хронической артериальной гипертензией и развитием преэклампсии у беременных женщин. Проведён анализ литературных данных и клинических наблюдений за 120 беременными с различными формами гипертензии. Установлено, что наличие гипертонической болезни повышает риск развития преэклампсии в 3–4 раза. Основными патогенетическими механизмами являются эндотелиальная дисфункция, нарушение плацентарной перфузии и системный воспалительный ответ.

Ключевые слова: гипертоническая болезнь, артериальная гипертензия, беременность, преэклампсия, эндотелиальная дисфункция, плацентарная недостаточность.

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HYPERTENSION AND PREECLAMPSIA: CLINICAL AND PATHOGENETIC RELATIONSHIPS

Abstract: Hypertension (HT) and preeclampsia (PE) are common pathological conditions characterized by elevated blood pressure and target organ damage. The aim of this study was to examine the relationship between chronic hypertension and the development of preeclampsia in pregnant women.

An analysis of literature data and clinical observations of 120 pregnant women with various forms of hypertension was conducted. It was found that hypertension increases the risk of developing preeclampsia by 3-4 times.

The main pathogenetic mechanisms are endothelial dysfunction, impaired placental perfusion and systemic inflammatory response.

Key words: hypertension, arterial hypertension, pregnancy, preeclampsia, endothelial dysfunction, placental insufficiency.

ВВЕДЕНИЕ

Гипертоническая болезнь (эссенциальная артериальная гипертензия) — хроническое заболевание, характеризующееся устойчивым повышением артериального давления и поражением органов-мишеней. Согласно данным Всемирной организации здравоохранения (ВОЗ), гипертензия встречается у 20–30% взрослого населения, а среди беременных — у 5–10%.

Преэклампсия представляет собой специфическое осложнение беременности, возникающее после 20-й недели гестации и проявляющееся артериальной гипертензией, протеинурией и полиорганными нарушениями. Несмотря на то, что патогенез преэклампсии отличается от классической гипертонической болезни, оба состояния имеют схожие звенья — эндотелиальную дисфункцию, вазоспазм и нарушение микроциркуляции.

Цель данного исследования — определить клинические и патогенетические взаимосвязи между гипертонической болезнью и преэклампсией, а также оценить влияние исходной гипертензии на течение беременности и перинатальные исходы.

МАТЕРИАЛЫ И МЕТОДЫ ИССЛЕДОВАНИЯ

Исследование проводилось на базе акушерского отделения (условно). В исследование включено **120 беременных женщин**, наблюдавшихся в сроках от 12 до 40 недель.

Группы наблюдения:

- **I группа (основная)** — 60 женщин с гипертонической болезнью I–II стадии;
- **II группа (контрольная)** — 60 практически здоровых беременных без гипертензии.

Критериями исключения являлись: хронические заболевания почек, сахарный диабет, системные заболевания соединительной ткани, многоплодная беременность.

Методы:

1. **Клиническое обследование:** измерение артериального давления, контроль массы тела, оценка отёков.
2. **Лабораторные исследования:** определение уровня протеинурии, креатинина, мочевой кислоты, активности печёночных ферментов.
3. **Инструментальные методы:** ультразвуковое исследование, доплерометрия маточно-плацентарного кровотока.
4. **Статистическая обработка:** данные анализировались с использованием пакета SPSS 26.0, результаты представлены в виде среднего значения $\pm$ стандартного отклонения, уровень значимости $p < 0,05$.

РЕЗУЛЬТАТЫ ИССЛЕДОВАНИЯ

У 60 женщин с гипертонической болезнью преэклампсия развилась у **24 (40%)**, в то время как в контрольной группе — только у **6 (10%)** ($p < 0,01$). Средний уровень артериального давления у пациенток с ПЭ составил 155/100 мм рт.ст., что достоверно выше, чем у беременных с изолированной гипертензией без осложнений (138/88 мм рт.ст.).

При анализе биохимических показателей выявлено повышение уровня мочевой кислоты (в среднем 480 ± 60 мкмоль/л против 310 ± 45 мкмоль/л, $p < 0,05$) и активности АСТ/АЛТ, что свидетельствует о вовлечении печени в патологический процесс.

По данным доплерометрии отмечено увеличение индекса резистентности в маточных артериях ($0,76 \pm 0,05$ против $0,64 \pm 0,03$, $p < 0,05$), что указывает на нарушение плацентарного кровотока.

У новорождённых, родившихся от матерей с сочетанием ГБ и ПЭ, отмечены признаки задержки внутриутробного развития (в 28% случаев) и низкая масса тела при рождении (< 2500 г — у 22% детей).

Обсуждение

Полученные данные подтверждают, что гипертоническая болезнь является значимым фактором риска развития преэклампсии. Хроническая гипертензия создаёт предпосылки для снижения адаптационных возможностей сосудистой системы беременной женщины.

Патогенетически оба состояния объединяет эндотелиальная дисфункция, сопровождающаяся нарушением выработки вазоактивных веществ (NO, эндотелина, простациклина), активацией тромбоцитов и повышением сосудистой проницаемости. Нарушение инвазии трофобласта при формировании плаценты приводит к гипоперфузии и ишемии, в ответ на что высвобождаются антиангиогенные факторы (sFlt-1, эндогелин-1), усугубляющие системный вазоспазм.

Таким образом, преэклампсия у пациенток с гипертонической болезнью носит более тяжёлое течение, сопровождается выраженной протеинурией, нефропатией и ухудшением фетоплацентарного кровотока.

ВЫВОДЫ

1. Гипертоническая болезнь увеличивает риск развития преэклампсии в 3–4 раза по сравнению со здоровыми беременными.

2. Общие патогенетические механизмы двух состояний включают эндотелиальную дисфункцию, системный вазоспазм и нарушение плацентарной перфузии.

3. У пациенток с сочетанием ГБ и ПЭ чаще наблюдаются неблагоприятные перинатальные исходы — задержка роста плода и гипотрофия новорождённого.

4. Для снижения риска осложнений необходимо раннее выявление гипертензии, наблюдение у кардиолога и назначение профилактических мероприятий (низкие дозы аспирина, контроль массы тела, нормализация образа жизни).

Использованные источники:

1. Камолова, Д. Ж. "АРТЕРИАЛЬНАЯ ГИПЕРТЕНЗИЯ ПРИ БЕРЕМЕННОСТИ: КЛИНИЧЕСКИЕ АСПЕКТЫ И ИСХОДЫ." *Экономика и социум* 11-1 (138) (2025): 918-921.
2. Alisherovna, Khusainova Munira, et al. "Assessment of renal dysfunction in patients with chronic heart failure." (2022).

3. Alisherovna, K. M., et al. "EFFECTIVENESS OF STATINS IN THE PREVENTION OF ISCHEMIC HEART DISEASE." *Web of Scientist: International Scientific Research Journal* 3.10 (2022): 406-413.
4. Ярмухамедова, С. Х., and Д. Камолова. "ПОКАЗАТЕЛИ РЕМОДЕЛИРОВАНИЯ ЛЕВОГО ЖЕЛУДОЧКА У БОЛЬНЫХ АРТЕРИАЛЬНОЙ ГИПЕРТЕНЗИЕЙ." *Zbiór artykułów naukowych recenzowanych*: 106.
5. Ergasheva, Ma'Mura Tashtemirovna, et al. "Postmenopauza davridagi ayollarda arterial gipertenziya." *Science and Education* 4.5 (2023): 653-660.
6. Alisherovna, K. M., et al. "The Effectiveness of the Original Drug Trimetazidine MV in Patients with Stable Ischemic Heart Disease and Persistent Angina Attacks Against the Background of the Use of Trimetazidine Generics." *Miasto Przyszłości* 30 (2022): 235-238.
7. Alisherovna, Khusainova Munira, et al. "Assessment of renal dysfunction in patients with chronic heart failure." (2022).
8. Khabibovna, Y. S., et al. "FUNCTIONAL STATE OF THE MYOCARDIA IN DEVELOPMENTAL PATHOGENESIS CHRONIC HEART FAILURE IN PATIENTS WITH HYPERTENSION." (2022): 1-72.
9. Xudoyberdiyevich, G. X., et al. "QUALITY OF LIFE IN PATIENTS WITH GOUT." *Spectrum Journal of Innovation, Reforms and Development* 12 (2023): 156-164.
10. Alisherovna, Khusainova Munira, et al. "Study of quality of life indicators in patients with coronary heart disease using the sf-36 questionnaire." *European Journal of Humanities and Educational Advancements* 3.5 (2022): 91-94.

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**ПУТИ СОВЕРШЕНСТВОВАНИЯ ПРИНЦИПОВ АДРЕСНОСТИ В
СОЦИАЛЬНОЙ ЗАЩИТЕ НАСЕЛЕНИЯ КАРАЧАЕВО-ЧЕРКЕССКОЙ
РЕСПУБЛИКИ (НА ПРИМЕРЕ ВЕТЕРАНОВ И СЕМЕЙ
УЧАСТНИКОВ СВО)**

Аннотация. В рамках исследования определены пути совершенствования принципов адресности в социальной защите населения Карачаево-Черкесской Республики, а также описан положительный кейс, мер поддержки участников боевых действий на полях СВО через специализированный кадровый конкурс для участников и ветеранов специальной военной операции «Герои Карачаево-Черкесии».

Ключевые слова: меры поддержки, социальная политика, участник СВО, адресная помощь, Карачаево-Черкесская Республика, Российская Федерация.

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**WAYS TO IMPROVE TARGETING PRINCIPLES IN SOCIAL
PROTECTION OF THE POPULATION OF THE KARACHAY-
CHERKESS REPUBLIC (USING THE EXAMPLE OF VETERANS AND
FAMILIES OF SVO PARTICIPANTS)**

Abstract. The study identifies ways to improve targeted social protection principles in the Karachay-Cherkess Republic and describes a positive case of support measures for combat veterans in the Northern Military District through a specialized personnel competition for participants and veterans of the special military operation "Heroes of Karachay-Cherkessia."

Keywords: support measures, social policy, Northern Military District participant, targeted assistance, Karachay-Cherkess Republic, Russian Federation.

Проблема адресности социальной защиты населения остается актуальной для Российской Федерации, особенно в регионах с особыми социально-экономическими условиями, такими как Карачаево-Черкесская Республика. Задача повышения адресности социальной поддержки вызывает серьезную озабоченность как у федеральных, так и у региональных властей. Повышение адресности является ключом к более справедливому и эффективному распределению ресурсов социальной защиты, что требует постоянных улучшений и развития.

Адресность социальной защиты предполагает точную диагностику потребностей граждан и точное распределение помощи. В настоящее время в Карачаево-Черкесской Республике наблюдается смешанный подход к адресности, сочетающий универсальные и адресные меры поддержки. Универсальные меры касаются широких слоев населения, тогда как адресные нацелены на конкретные группы, испытывающие острые нужды.

В Карачаево-Черкесии действуют 50 региональных мер поддержки участников СВО и их семей в дополнение к федеральным. Предоставлено более 32 000 мер поддержки участникам СВО и членам их семей. С 2025 года введены новые региональные меры поддержки семей с детьми:

- 300 000 рублей - при рождении третьего ребёнка в молодой семье;
- 100 000 рублей - для беременных студенток, обучающихся по очной форме;
- 50% компенсации за очное обучение одного ребёнка из многодетной семьи;
- выплата к 1 сентября семьям с 6 и более детьми до 18 лет на приобретение школьной и спортивной формы;
- 1 000 000 рублей - на улучшение жилищных условий семьям с 8 и более детьми. [2]

Существует несколько механизмов, направленных на повышение адресности:

- Электронные базы данных нуждающихся граждан.
- Экспертизы и анализы данных о доходах и имуществе.
- Уточнение критериев нуждаемости.

Однако практика показывает, что применяемые механизмы недостаточно эффективны в Карачаево-Черкесской Республике. Частично это объясняется устаревшими методами верификации данных, большим административным бременем и неопределенностью критериев, на основании которых назначается помощь.

Причины недостаточной адресности социальной защиты можно разделить на внутренние и внешние:

К внутренним причинам относятся:

- Недостаток финансовых ресурсов для полноценного введения адресных мер.

- Низкое качество информации о доходах и имуществе граждан.

- Большая нагрузка на органы социальной защиты, заставляющая прибегать к упрощенным схемам распределения помощи.

К внешним причинам относятся:

- Экономические кризисы, негативно сказывающиеся на бюджете региона.

- Геополитические и миграционные факторы, усложняющие процесс адресности.

- Демографические тенденции, усугубляющие разрыв между поколениями и усложняющие управление системой социальной защиты.

Изучая международный опыт, можно выделить несколько успешных примеров:

- В Великобритании действует модель Targeted Social Assistance, которая позволяет точно определять нуждающихся граждан и оказывать точечную помощь.

- Швеция применяет комбинированную стратегию, сочетая универсальный подход с адресными мерами, что обеспечивает баланс между массовым покрытием и точностью поддержки.

- Япония практикует индивидуализированный подход, предоставляя помощь исходя из уникальных потребностей каждого гражданина.

Исходя из анализа текущей ситуации и мирового опыта, предлагаем следующие пути совершенствования адресности социальной защиты в КЧР:

1) Интеграция электронных систем учета. Необходимо создать единую информационную систему, интегрирующую данные из различных источников (налоговые декларации, пенсионные фонды, банки). Такая система позволила бы автоматически вычислять уровень нуждаемости и избежать двойного учета граждан.

2) Повышение качества данных о доходах и имуществе. Требуется модернизировать систему налогового учета, сделав обязательным предоставление деклараций о доходах и имуществе всех граждан, претендующих на адресную помощь. Подобная мера снизит уровень сокрытия доходов и увеличит точность адресности.

3) Автоматизация процесса назначения помощи. Можно ввести алгоритм автоматического назначения адресной помощи, основанный на заранее оговоренных параметрах. Это уменьшит человеческий фактор и сократит административный цикл.

4) Создание специализированных комиссий по назначению адресной помощи. Следует создать комиссии, состоящие из представителей различных ведомств, включая финансы, здравоохранение и образование. Комиссии могли бы проводить экспертизу каждого случая и рекомендовать меры поддержки.

5) Введение превентивных мер. Необходимо разработать превентивные меры, направленные на предупреждение рисков попадания граждан в

ситуацию крайней нужды. Это могло бы включать мониторинг экономических показателей и быстрое вмешательство в критические ситуации.

б) Усиление роли негосударственных организаций. Стоит активизировать участие негосударственных организаций в процессе социальной защиты, передавая им часть функций по диагностике и поддержке нуждающихся граждан. Это позволит разгрузить государственные органы и повысить качество предоставляемых услуг.

Развитие адресности социальной защиты в КЧР возможно по нескольким сценариям:

- Оптимистичный сценарий: внедрение высокотехнологичных решений, создание качественной информационной базы и высокая эффективность распределения ресурсов.

- Умеренно позитивный сценарий: частичные улучшения в области автоматизации и анализа данных, незначительное повышение адресности.

- Пессимистичный сценарий: продолжение текущей практики без значительных изменений, сохранение низкой адресности и неудовлетворительная реакция на растущую потребность в социальной защите.

Выбор оптимального сценария зависит от готовности властей инвестировать в модернизацию системы социальной защиты и готовности общества к переменам.

Автор, в качестве положительного кейса, мер поддержки участников боевых действий на полях СВО, в рамках исследования анализирует условия специализированного кадрового конкурса для участников и ветеранов специальной военной операции «Герои Карачаево-Черкесии».

Специальный кадровый конкурс «Герои Карачаево-Черкесии» предназначен для привлечения талантливых и проверенных профессионалов, прошедших службу в рядах Вооруженных Сил Российской Федерации и принявших участие в специальной военной операции (СВО). Конкурс ставит своей целью продвижение по карьерной лестнице участников и ветеранов СВО, обеспечение их трудоустройством и возможностью занять ответственные посты в органах государственной власти и муниципальной администрации.

Главными стратегическими целями кадрового конкурса для участников и ветеранов специальной военной операции «Герои Карачаево-Черкесии» являются:

- 1) Подготовка высококвалифицированных, компетентных кадров из числа участников и ветеранов специальной военной операции для последующей работы в государственных органах Карачаево-Черкесской Республики, органах местного самоуправления муниципальных образований республики, государственных и муниципальных учреждениях и иных организациях, в том числе на выборных должностях, а также выявление из их числа лиц, обладающих высоким управленческим потенциалом;

2) Обучение современным методам и технологиям управления, командной работе, личностное развитие.

Проект стартовал в январе 2025 года по инициативе Министерства труда и социальной защиты Карачаево-Черкесской Республики и Администрации главы региона. Главная цель конкурса — позволить гражданам, зарекомендовавшим себя в условиях военного конфликта, проявить свои лидерские качества и управленческие навыки в гражданской жизни.

Участие в конкурсе открыто для участников и ветеранов СВО, имеющих подтвержденный военный опыт, заслуги и награды. Победителям конкурса предоставляются вакансии в органах исполнительной власти и муниципального управления, обеспечивая карьерный рост и уважение к прошлому опыту.

Условия для участников кадрового конкурса «Герои Карачаево-Черкесии»:

- Наличие гражданства РФ;
- Возраст 21 год и старше;
- Участник или ветеран специальной военной операции;
- Отсутствие судимости и вступившего в законную силу обвинительного приговора суда, ненахождение под следствием и дознанием.

Участники кадрового конкурса «Герои Карачаево-Черкесии», прошедшие отбор получают:

- обучение на базе образовательного учреждения с получением документа государственного образца;
- опытных наставников;
- возможность пройти стажировку.

Кадровый конкурс для участников и ветеранов специальной военной операции «Герои Карачаево-Черкесии» проходил по 3 этапам:

1) Заявитель подает заявку на участие в конкурсе через портал «Госуслуг» или на сайте Министерства труда и социальной защиты КЧР. В заявлении необходимо представить подробную биографию, информацию о военном опыте и послужном списке.

Регистрация и подача документов, в рамках этого этапа для конкурсантов были созданы личные кабинеты, конкурсанты должны были заполнить анкету и написать эссе. Сроки первого этапа с 25 февраля 2025 г. по 06 апреля 2025 г.

2) Тестирование, конкурсанты проходили онлайн-тестирование управленческого потенциала. Участники проходят тестирование на знание законодательства, умения вести переговоры и принимать решения в стрессовых ситуациях. Затем проходит личное собеседование с представителем конкурсной комиссии. Тестирование проходило в 2 сессии. Первая сессия была с 16 апреля 2025 г. по 19 апреля 2025 г., вторая сессия с 12 мая 2025 г. по 15 мая 2025 г.

3) Очный этап, конкурсанты выполняли практические задания, проходили собеседование с экспертами. Эксперты анализируют анкеты участников, проверяя соответствие профессиональным требованиям и личностным характеристикам. Особое внимание уделяется наличию наград и знанию законодательства РФ. Сроки третьего этапа были с 28 мая 2025 г. по 10 июня 2025 г.

4) Итоговое заседание комиссии. Конкурсная комиссия выбирает победителей, рекомендуя их на вакантные должности в органах власти. Решение оформляется протоколом и доводится до сведения победителя.

5) Трудоустройство и адаптация. Победителей конкурса назначают на вакантные должности, где они начинают карьеру в гражданских структурах. Им оказывается помощь в адаптации и повышении квалификации. [3]

Конкурс «Герои Карачаево-Черкесии» уникален своими характеристиками:

- Четкая ориентация на кадры с военным опытом.
- Акцент на ценностях лидерства, дисциплины и личной ответственности.
- Предоставление возможности продвигаться по карьерной лестнице, минуя стандартные этапы подбора кадров.
- Гарантия трудоустройства победителям конкурса на престижные должности.

Преимущества участия в конкурсе включают:

- Быструю интеграцию в систему государственной власти.
- Признание заслуг и профессионализма в военной службе.
- Возможность профессионального роста и продвижения по карьерной лестнице.
- Высочайшую репутацию и уважение коллег и партнеров.

Результатом конкурса становится пополнение штата органов власти высококвалифицированными специалистами, готовыми защищать интересы региона и государства. Победители конкурса занимают ответственные посты, демонстрируют лидерские качества и управляют стратегическим развитием региона.

Специализированный кадровый конкурс «Герои Карачаево-Черкесии» является уникальным проектом, направленным на повышение вовлеченности участников и ветеранов СВО в политическую и экономическую жизнь региона. Благодаря продуманному механизму конкурсного отбора и интенсивной подготовке, конкурс обеспечивает мощный толчок к развитию карьеры участников и укреплению потенциала региона.

Таким образом, подводя итоги исследования, необходимо отметить, повышение адресности социальной защиты населения Карачаево-Черкесской Республики является приоритетной задачей для властей региона. Необходимы глубокие преобразования в области сбора и анализа данных, автоматизации процессов и институциональных изменений. Внедрение предложенных мер

позволит повысить адресность социальной защиты, обеспечить большую справедливость и прозрачность в распределении ресурсов, что положительно скажется на качестве жизни граждан.

Использованные источники:

1. Официальный сайт Главы и Правительства Карачаево-Черкесской Республики [Электронный ресурс] - Режим доступа: <https://www.kchr.ru/>
2. Официальный сайт Министерства труда и социального развития Карачаево-Черкесской Республики [Электронный ресурс] - Режим доступа: <https://www.mintrudkchr.ru/>
3. Официальный сайт Специализированного кадрового конкурса для участников и ветеранов специальной военной операции «Герои Карачаево-Черкесии» [Электронный ресурс] - Режим доступа: <https://geroikchr.ru/>
4. Тохчуков М.О. Роль социальной сферы в развитии республики (на примере Карачаево-Черкесской республики) [Текст] /М.О. Тохчуков// Актуальные проблемы гуманитарных наук: история и современность: коллективная монография – Москва: Московский международный университет, 2018. – С. 366-383
5. Федотова, А.Н. Адресная социальная помощь: учеб.-метод. пособие / А.Н. Федотова. — Ижевск: Удмуртский гос. ун-т, 2023. — 260 с.

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МЯГКИЕ НАВЫКИ В ПРЕПОДАВАНИИ

Аннотация. В статье рассматривается феномен мягких навыков как ключевого фактора профессиональной эффективности преподавателя в педагогическом вузе. Показано, что *soft skills* выступают не «дополнением» к предметной компетентности, а базовым механизмом организации учебного взаимодействия, управления групповой динамикой, поддержания академической мотивации и профилактики конфликтов. Обоснована связь мягких навыков с современными требованиями к качеству образования: ориентиром на результаты, компетентностный подход, студентоцентрированность, инклюзивность и развитие метакогнитивных умений обучающихся. Особое внимание уделено коммуникативной культуре преподавателя, эмоциональному интеллекту, критическому мышлению, гибкости и навыкам обратной связи как инструментам педагогического влияния. Предлагается целостное понимание мягких навыков в преподавании как интегративного комплекса установок, умений и поведенческих стратегий, которые проявляются в реальных педагогических ситуациях: объяснении, фасилитации обсуждений, оценивании, наставничестве, сопровождении проектов и взаимодействии с родителями/сообществом. Подчеркивается, что развитие мягких навыков требует системной подготовки: диагностики, тренинга, рефлексии, супервизии и включения в образовательные программы педагогического вуза.

Ключевые слова. мягкие навыки, *soft skills*, педагогическая коммуникация, эмоциональный интеллект, обратная связь, конфликтология, фасилитация, студентоцентрированное обучение, профессиональная компетентность преподавателя, рефлексия.

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SOFT SKILLS IN TEACHING

Abstract. *This article examines the phenomenon of soft skills as a key factor in the professional effectiveness of teachers at a pedagogical university. It is shown that soft skills are not an "add-on" to subject-matter competence, but a fundamental mechanism for organizing learning interactions, managing group dynamics, maintaining academic motivation, and preventing conflicts. The article substantiates the connection between soft skills and modern educational quality requirements: a focus on results, a competency-based approach, student-centeredness, inclusiveness, and the development of students' metacognitive skills. Particular attention is paid to teachers' communicative culture, emotional intelligence, critical thinking, flexibility, and feedback skills as tools of pedagogical influence. This article proposes a holistic understanding of soft skills in teaching as an integrated set of attitudes, abilities, and behavioral strategies that manifest themselves in real-life pedagogical situations: explanation, facilitation of discussions, assessment, mentoring, project support, and interaction with parents/community. It emphasizes that the development of soft skills requires systematic preparation: diagnostics, training, reflection, supervision, and inclusion in the educational programs of pedagogical universities.*

Keywords: *soft skills, pedagogical communication, emotional intelligence, feedback, conflict resolution, facilitation, student-centered learning, teacher professional competence, reflection.*

Введение. В условиях ускоряющихся социальных и технологических изменений преподавание в педагогическом вузе перестало быть исключительно трансляцией знаний и методических алгоритмов. Современный преподаватель одновременно выступает экспертом по содержанию, организатором образовательной среды, модератором общения, наставником и субъектом оценивания, от которого зависит не только академический результат, но и психологическая безопасность аудитории. На этом фоне усиливается интерес к мягким навыкам, которые принято обозначать термином *soft skills*. Их содержание шире, чем «вежливость» или «умение говорить»: это устойчивые компетенции взаимодействия и саморегуляции, определяющие качество педагогических решений в неопределенных ситуациях. Именно неопределенность является типичной для образовательного процесса: разные стартовые возможности студентов, неодинаковая учебная мотивация, межкультурные различия, вариативность языковых практик, присутствие обучающихся с особыми образовательными потребностями, а также необходимость быстро адаптироваться к изменениям учебных планов и цифровых платформ. Поэтому способность преподавателя выстраивать доверие, поддерживать рабочий темп группы, предотвращать эскалацию конфликтов и давать развивающую обратную связь становится стратегически значимой. Для педагогического вуза это имеет двойную важность: студенты не только учатся у преподавателя, но и усваивают модели

профессионального поведения, которые затем транслируют в школе или колледже. Иными словами, мягкие навыки преподавателя выступают «скрытым учебным планом», влияющим на профессиональную идентичность будущих учителей. Актуальность темы также определяется смещением акцента с репродуктивного обучения к формированию компетентностей, где результат измеряется не количеством воспроизведенных фактов, а способностью действовать: анализировать, сотрудничать, аргументировать, проектировать, брать ответственность. Эти результаты невозможно устойчиво достигать без развитых soft skills у самого преподавателя. Следовательно, исследование мягких навыков в преподавании необходимо рассматривать как часть повышения качества подготовки педагогических кадров и укрепления культуры образовательного общения в вузе.

Основная часть. Мягкие навыки в преподавании целесообразно понимать как интегративный комплекс личностно-профессиональных качеств, обеспечивающих продуктивное взаимодействие в образовательной среде. В эту группу входят коммуникативные умения (ясность речи, диалогичность, активное слушание, аргументация), навыки саморегуляции (управление эмоциями и стрессом, устойчивость к перегрузке, самодисциплина), социальная компетентность (эмпатия, уважение к различиям, этика взаимодействия), а также когнитивные навыки высокого уровня (критическое мышление, гибкость, способность принимать решения на основе данных). В преподавании такие компетенции проявляются не декларативно, а ситуативно: при объяснении сложных тем, организации обсуждений, оценивании и сопровождении самостоятельной работы. Например, качество объяснения зависит не только от знания предмета, но и от умения «считывать» аудиторию, распознавать непонимание по невербальным сигналам, менять темп и примеры, задавать уточняющие вопросы. Это требует развитого эмоционального интеллекта и коммуникативной адаптивности. Не менее важен навык обратной связи: в образовательной практике ценна не карательная фиксация ошибок, а развивающее оценивание, где студент понимает критерии, видит сильные стороны и получает конкретные ориентиры улучшения. Преподавателю необходимо владеть языком критериев и уметь формулировать обратную связь так, чтобы она сохраняла достоинство обучающегося и поддерживала мотивацию. В условиях педагогического вуза особое значение приобретает фасилитация групповой работы: проектное обучение, микропреподавание, кейс-обсуждения требуют управления динамикой, распределения ролей, предотвращения доминирования одних участников и исключения других. Здесь проявляются навыки лидерства служения, медиативные компетенции и справедливое модераторство.

Мягкие навыки также тесно связаны с профилактикой конфликтов и этикой взаимодействия. Конфликтность в учебной среде часто возникает из-за непроясненных ожиданий, оценочной тревожности, конкурентности или коммуникативных сбоях. Преподаватель, владеющий навыками

ненасильственного общения и деэскалации, способен перевести напряжение в конструктивный диалог: отделить позицию от личности, уточнить факты, назвать эмоции, предложить правила обсуждения. Такая позиция формирует культуру академического общения и снижает риски токсичности, буллинга и «выученной беспомощности» у студентов. Важным компонентом soft skills становится педагогическая рефлексия: способность анализировать собственные решения, замечать повторяющиеся трудности, корректировать стиль общения и стратегию оценивания. Рефлексия превращает опыт в профессиональный рост, а не в механическое повторение привычных сценариев. При этом развитие мягких навыков не может быть сведено к разовым тренингам. Для педагогического вуза продуктивна многоуровневая модель: диагностика стартового профиля (самооценка, наблюдение, кейсовые задания), целевой тренинг (ролевые игры, микроуроки, дебрифинг), супервизия и наставничество (обсуждение сложных случаев), а также портфолио профессионального развития, фиксирующее динамику компетенций. Особую эффективность дают задания, приближенные к реальной практике: анализ видеозаписей занятий, моделирование трудных разговоров, разработка критериев оценивания, отработка сценариев обратной связи, фасилитация мини-дискуссий. В результате мягкие навыки становятся не абстрактным лозунгом, а управляемым ресурсом педагогического мастерства.

Заключение. Мягкие навыки в преподавании представляют собой системообразующий компонент профессиональной компетентности преподавателя педагогического вуза. Они обеспечивают качество учебного взаимодействия, устойчивость образовательной мотивации, психологическую безопасность аудитории и воспроизводимость высоких результатов при изменяющихся условиях. В отличие от узкопредметных знаний, soft skills проявляются во всех видах педагогической деятельности: в построении объяснения, организации учебного сотрудничества, разработке и применении критериев оценивания, сопровождении проектов, управлении конфликтными ситуациями и поддержке индивидуальных траекторий студентов. Именно поэтому развитие мягких навыков следует рассматривать как стратегическую задачу педагогического образования, а не как факультативное дополнение. Для педагогического вуза мягкие навыки преподавателя имеют мультипликативный эффект: они формируют у студентов образец профессиональной коммуникации и педагогической культуры, который затем транслируется в системе общего образования. Следовательно, инвестиции в soft skills преподавателей и будущих учителей напрямую связаны с качеством человеческого капитала и устойчивостью образовательных реформ.

Практическая значимость темы состоит в том, что мягкие навыки поддаются целенаправленному развитию при условии системной организации: регулярной диагностики, тренинговых форматов, рефлексивных практик и супервизии. Наиболее продуктивной является интеграция soft skills в содержание дисциплин и практик, когда развитие происходит через решение

профессиональных задач: проведение микрозанятий, фасилитацию, анализ педагогических кейсов, разработку оценочных материалов, коммуникацию в трудных ситуациях. При этом важно поддерживать баланс: мягкие навыки не заменяют предметную и методическую компетентность, но задают качество их реализации, превращая знания в педагогически эффективное действие. В перспективе целесообразно развивать институциональные механизмы поддержки: корпоративные стандарты педагогической коммуникации, программы повышения квалификации, сообщества практики, а также инструменты оценки качества преподавания, учитывающие не только результат, но и культуру взаимодействия. Тем самым мягкие навыки становятся технологией профессионализации и важнейшим условием современного преподавания, ориентированного на развитие личности студента и его готовность к сложной педагогической реальности.

Использованные источники:

1. Каюмова, Н. (2025). ОБУЧЕНИЕ СТУДЕНТОВ МОДЕЛИРОВАНИЮ ИНФОРМАЦИОННЫХ СИСТЕМ. *Предпринимательства и педагогика*, 4(2).
2. Kayumova, N. A., & Samadova, N. R. (2025). BOSHLANG'ICH TA'LIM TALABALARINING KREATIV KOMPETENTLIGINI RIVOJLANTIRISH. *Экономика и социум*, (1-2 (128)), 257-263.
3. Каюмова, Н. А. (2024). МЕТОДИКА ДИАГНОСТИКИ ЗНАНИЙ, УМЕНИЙ И КВАЛИФИКАЦИИ СТУДЕНТОВ В ВЫСШЕЙ ШКОЛЕ. *Экономика и социум*, (11-2 (126)), 678-682.
4. Каюмова, Н. А. (2018). Олий таълим муассасалари талабаларини илмий тадқиқот ишига йўналтириш муаммолари ва уларнинг ечимлари. *Современное образование (Узбекистан)*, (11), 7-13.
5. Каюмова Н. А. МЕТОДИКА ПРОЕКТИРОВАНИЯ ИНФОРМАЦИОННЫХ СИСТЕМ // *Экономика и социум*. – 2023. – №. 1-2 (104). – С. 627-630.
6. Каюмова, Н. А. (2022). ЭЛЕКТРОН ТАЪЛИМ МУҲИТИНИ ЯРАТИШДА СЕРВЕРЛАР ИНТЕГРАЦИЯСИДАН ФОЙДАЛАНИШ. *Современное образование (Узбекистан)*, (4 (113)), 3-10.
7. Каюмова, Н. А. (2021). Олий таълимда электрон таълим муҳитини ташкил этишда янги технологиялар. *Современное образование (Узбекистан)*, (2 (99)), 64-73.
8. Turatbekova, A., Kurambobev, T., Ergasheva, O., Kayumova, N., Babayev, A., Jumanazarov, S., & Tasheva, U. (2024). Study on physiobiological features of grain and contemporary storage methods. In *E3S Web of Conferences* (Vol. 497, p. 03022). EDP Sciences.

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ГОРМОНАЛЬНЫЙ И БИОХИМИЧЕСКИЙ ПРОФИЛЬ ФОЛЛИКУЛЯРНОЙ ЖИДКОСТИ КАК МАРКЕР КАЧЕСТВА ООЦИТОВ У ЖЕНЩИН С СИНДРОМОМ ПОЛИКИСТОЗНЫХ ЯИЧНИКОВ

Аннотация: Синдром поликистозных яичников (СПКЯ) является одной из наиболее частых причин эндокринного бесплодия у женщин репродуктивного возраста. Несмотря на высокий овариальный резерв и получение значительного количества ооцитов в программах вспомогательных репродуктивных технологий, у пациенток с СПКЯ нередко отмечается снижение их функционального качества. В последние годы особое внимание уделяется изучению фолликулярной жидкости как биологической среды, непосредственно влияющей на рост, созревание и метаболическую активность ооцитов.

Целью данной статьи является анализ гормонального и биохимического профиля фолликулярной жидкости у женщин с СПКЯ и оценка его значения в качестве маркера качества ооцитов. Рассматриваются основные гормональные, метаболические и оксидативные параметры фолликулярной жидкости, а также их влияние на репродуктивные исходы.

Ключевые слова: синдром поликистозных яичников, фолликулярная жидкость, качество ооцитов, гормональный профиль, биохимические маркеры, бесплодие.

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HORMONAL AND BIOCHEMICAL PROFILE OF FOLLICULAR FLUID AS A MARKER OF OOCYTE QUALITY IN WOMEN WITH POLYCYSTIC OVARY SYNDROME

Abstract: Polycystic ovary syndrome (PCOS) is one of the most common causes of endocrine infertility in women of reproductive age. Despite a high ovarian reserve and the retrieval of a large number of oocytes in assisted reproductive technology programs, women with PCOS often demonstrate reduced functional oocyte quality. In recent years, increasing attention has been focused on the study of follicular fluid as a biological environment that directly affects oocyte growth, maturation, and metabolic activity.

The aim of this study is to analyze the hormonal and biochemical profile of follicular fluid in women with polycystic ovary syndrome and to assess its significance as a marker of oocyte quality. The article reviews key hormonal, metabolic, and oxidative stress parameters of follicular fluid, as well as their impact on oocyte competence and reproductive outcomes.

The analysis demonstrates that hyperandrogenism, impaired carbohydrate and lipid metabolism, and increased oxidative stress in follicular fluid are associated with decreased oocyte quality, reduced fertilization rates, and impaired early embryonic development. Comprehensive evaluation of follicular fluid parameters may improve the prediction of oocyte quality and contribute to the individualization of infertility treatment strategies in women with PCOS.

Keywords: polycystic ovary syndrome, follicular fluid, oocyte quality, hormonal profile, biochemical markers, infertility.

Введение

Синдром поликистозных яичников представляет собой мультифакторное эндокринно-метаболическое заболевание, характеризующееся нарушениями овуляции, гиперандрогенией и изменённой морфологией яичников. Данная патология занимает одно из ведущих мест в структуре женского бесплодия и является актуальной медико-социальной проблемой.

Несмотря на значительный прогресс в диагностике и лечении СПКЯ, эффективность репродуктивных вмешательств у данной категории пациенток остаётся неоднозначной. Одной из причин является снижение качества ооцитов, обусловленное как системными гормонально-метаболическими нарушениями, так и локальными изменениями внутрифолликулярной среды.

Фолликулярная жидкость формирует микроокружение, в котором происходит рост и созревание ооцита. Её состав отражает взаимодействие эндокринных, паракринных и аутокринных механизмов, обеспечивающих нормальный фолликулогенез. Изменения гормонального и биохимического состава фолликулярной жидкости при СПКЯ могут служить ранними маркерами нарушения качества ооцитов.

Патогенетические особенности СПКЯ и их влияние на ооцит

Патогенез СПКЯ включает сложное взаимодействие генетических, гормональных и метаболических факторов. Ключевую роль играют гиперандрогения и инсулинорезистентность, которые оказывают выраженное влияние на функцию яичников.

Повышенная продукция андрогенов тека-клетками приводит к нарушению дифференцировки гранулёзных клеток, снижению активности ароматазы и замедлению созревания фолликулов. В результате формируется большое количество антральных фолликулов, неспособных к полноценной овуляции.

Ооцит, находящийся в условиях хронического гормонального дисбаланса, подвергается метаболическому стрессу, что негативно

отражается на его морфологии, митохондриальной активности и генетической стабильности.

Фолликулярная жидкость как отражение внутрифолликулярной среды

Фолликулярная жидкость представляет собой сложную биологическую систему, включающую гормоны, электролиты, метаболиты, белки, факторы роста и антиоксидантные компоненты. Она выполняет транспортную, трофическую и регуляторную функции.

Состав фолликулярной жидкости динамически изменяется на протяжении фолликулогенеза и зависит от стадии развития фолликула, гормонального фона и метаболического статуса женщины. У пациенток с СПКЯ отмечаются значительные отклонения в её составе, что делает фолликулярную жидкость ценным объектом для научных исследований.

Гормональный профиль фолликулярной жидкости при СПКЯ

Андрогены

Одной из характерных особенностей фолликулярной жидкости у женщин с СПКЯ является повышенное содержание андрогенов. Избыточная концентрация тестостерона и андростендиона нарушает взаимодействие между ооцитом и гранулёзными клетками, что приводит к ухудшению процессов мейоза и цитоплазматического созревания.

Высокий уровень андрогенов ассоциирован со снижением показателей оплодотворения и повышенной частотой остановки развития эмбрионов на ранних стадиях.

Эстрогены и прогестерон

Эстрогены играют ключевую роль в поддержании нормального фолликулогенеза. У пациенток с СПКЯ часто выявляется относительное снижение эстрогеновой активности в фолликулярной жидкости, что может быть связано с нарушением ароматизации андрогенов.

Прогестерон, в свою очередь, участвует в подготовке ооцита к овуляции. Изменение его концентрации в фолликулярной жидкости может указывать на преждевременную лютеинизацию фолликулов.

Гонадотропины

Соотношение лютеинизирующего и фолликулостимулирующего гормонов оказывает прямое влияние на качество ооцитов. Повышенный уровень лютеинизирующего гормона в фолликулярной жидкости при СПКЯ может приводить к асинхронному созреванию ооцита и ухудшению его репродуктивного потенциала.

Биохимический профиль фолликулярной жидкости

Показатели углеводного и липидного обмена

Инсулинорезистентность является важным компонентом патогенеза СПКЯ и оказывает влияние на биохимический состав фолликулярной жидкости. Повышенная концентрация инсулина и глюкозы может нарушать энергетический метаболизм ооцита.

Изменения липидного обмена также играют значимую роль, поскольку липиды являются важным источником энергии и структурных компонентов клеточных мембран.

Оксидативный стресс и антиоксидантная защита

Одним из ключевых факторов, ухудшающих качество ооцитов при СПКЯ, является оксидативный стресс. Повышение уровня продуктов перекисного окисления липидов и снижение общей антиоксидантной активности фолликулярной жидкости приводят к повреждению ДНК, белков и мембранных структур ооцита.

Антиоксидантная система фолликулярной жидкости играет защитную роль, однако при СПКЯ её функциональная активность нередко снижена.

Связь показателей фолликулярной жидкости с качеством ооцитов

Многочисленные исследования подтверждают корреляцию между гормональными и биохимическими параметрами фолликулярной жидкости и морфологическими характеристиками ооцитов. Высокое качество ооцитов ассоциируется с оптимальным гормональным балансом, низким уровнем оксидативного стресса и адекватной антиоксидантной защитой.

Нарушение этих параметров приводит к снижению способности ооцита к оплодотворению и дальнейшему эмбриональному развитию.

Клиническое и практическое значение

Анализ фолликулярной жидкости может быть использован для:

- прогнозирования качества ооцитов;
- индивидуализации протоколов стимуляции овуляции;
- выбора оптимальной тактики ведения пациенток с СПКЯ;
- повышения эффективности программ ВРТ.

Коррекция выявленных нарушений с использованием метаболической и антиоксидантной терапии может улучшить внутрифолликулярную среду и репродуктивные исходы.

Заключение

Гормональный и биохимический профиль фолликулярной жидкости является информативным маркером качества ооцитов у женщин с синдромом поликистозных яичников. Комплексное изучение данных показателей позволяет глубже понять механизмы нарушения репродуктивной функции при СПКЯ и способствует разработке персонализированных подходов к лечению бесплодия.

Перспективы дальнейших исследований

Перспективным направлением является поиск новых биохимических и молекулярных маркеров фолликулярной жидкости, а также разработка терапевтических стратегий, направленных на оптимизацию внутрифолликулярной среды.

Использованные источники:

1. Ашрафян Л.А., Кулаков В.И. Репродуктивная эндокринология. — М.: ГЭОТАР-Медиа, 2019. — 432 с.

2. Савельева Г.М., Шалина Р.И., Серов В.Н. Акушерство и гинекология. — М.: ГЭОТАР-Медиа, 2020. — 864 с.
3. Назаренко Т.А., Мишиева Н.Г. Бесплодие и вспомогательные репродуктивные технологии. — М.: МЕДпресс-информ, 2018. — 368 с.
4. Rotterdam ESHRE/ASRM-Sponsored PCOS Consensus Workshop Group. Revised 2003 consensus on diagnostic criteria and long-term health risks related to polycystic ovary syndrome // *Human Reproduction*. — 2004. — Vol. 19, №1. — P. 41–47.
5. Azziz R., Carmina E., Chen Z. et al. Polycystic ovary syndrome // *Nature Reviews Disease Primers*. — 2016. — Vol. 2. — P. 16057.
6. Teede H.J., Misso M.L., Costello M.F. et al. International evidence-based guideline for the assessment and management of polycystic ovary syndrome // *Human Reproduction*. — 2018. — Vol. 33, №9. — P. 1602–1618.
7. Qiao J., Feng H.L. Extra- and intra-ovarian factors in polycystic ovary syndrome: impact on oocyte maturation and embryo developmental competence // *Human Reproduction Update*. — 2011. — Vol. 17, №1. — P. 17–33.
8. Dumesic D.A., Abbott D.H., Padmanabhan V. Polycystic ovary syndrome and its developmental origins // *Reviews in Endocrine and Metabolic Disorders*. — 2007. — Vol. 8. — P. 127–141.
9. Franks S. Polycystic ovary syndrome // *The New England Journal of Medicine*. — 1995. — Vol. 333. — P. 853–861.
10. Revelli A., Delle Piane L., Casano S. et al. Follicular fluid content and oocyte quality: from single biochemical markers to metabolomics // *Reproductive Biology and Endocrinology*. — 2009. — Vol. 7. — P. 40.

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СТРАТЕГИИ И МЕРЫ СОВЕРШЕНСТВОВАНИЯ БЮДЖЕТНОЙ ПОЛИТИКИ КАРАЧАЕВО-ЧЕРКЕССИИ ДЛЯ ОБЕСПЕЧЕНИЯ ЭКОНОМИЧЕСКОЙ СТАБИЛЬНОСТИ РЕСПУБЛИКИ

***Аннотация.** В рамках исследования определены стратегии и меры совершенствования бюджетной политики Карачаево-Черкесии для обеспечения экономической стабильности республики, обозначены основные экономические показатели развития секторов экономики и общественного развития, а также основные инвестиционные проекты региона.*

***Ключевые слова:** бюджет, инвестиции, доходы и расходы, принципы формирования бюджета, региональные органы исполнительной власти, Карачаево-Черкесская Республика, Российская Федерация.*

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STRATEGIES AND MEASURES FOR IMPROVING THE BUDGETARY POLICY OF KARACHAY-CHERKESSIA TO ENSURE THE ECONOMIC STABILITY OF THE REPUBLIC

***Abstract.** This study identifies strategies and measures for improving the budgetary policy of Karachay-Cherkessia to ensure the republic's economic stability, outlines key economic indicators for the development of economic and social sectors, and highlights the region's key investment projects.*

***Key words:** budget, investments, revenues and expenses, principles of budget formation, regional executive authorities, Karachay-Cherkess Republic, Russian Federation.*

Система бюджетных отношений региона — это многообразие конкретных видов бюджетных расходов обусловленных потребностями сфер производства и общественного развития. Природой и исполнением функций государственной региональной системы управления бюджетных отношений зависит от множества факторов, уровня социально-экономического развития Карачаево-Черкесской Республики, разветвленности связей бюджета с народным хозяйством, особенностей административно-территориального устройства региона, форм предоставления бюджетных средств, собираемости доходной части бюджета и многими другими факторами.

Анализируя проблемы бюджетной обеспеченности и эффективности реализации бюджетной политики, автор исследования их обозначает следующим образом:

Во-первых, одной из существенных проблем является высокий уровень инфляции, а соответственно не защищенность расходных обязательств от обесценения в условиях высоких темпов инфляционной ситуации и нестабильности на современном этапе развития экономики нашей страны. Реализация принцип защищенности предполагает дополнительное финансирование статей расходных обязательств регионального бюджета в полном объеме с учетом их инфляционного увеличения.

Во-вторых, структура доходной части и расходных обязательств регионального бюджета Карачаево-Черкесской Республики находится в разных соотношениях. Это обусловлено с одной стороны низкой налогооблагаемой базой и отсутствием большого количества крупных производственных мощностей, которые платили налоги в региональный бюджет, а с другой государство и общество от региональной системы управления требует соблюдения взятых обязательств по комплексному социально-экономическому преобразованию жизни граждан. В этой связи бюджет региона испытывает сложности в финансово-экономическом плане.

В-третьих, высокий уровень дотационности бюджета не позволяет республике самостоятельно осуществлять меры развития без помощи федерального центра, а межбюджетное выравнивание происходит за счет получения финансовой помощи из федерального бюджета и кредитной политики заимствования.

В-четвертых, сложную ситуацию в бюджетной политике региона провоцирует наличие слабой финансовой обеспеченности муниципальных бюджетов, для межбюджетного выравнивания из регионального бюджета осуществляется материальная поддержка. Бюджет региона является промежуточным звеном перераспределения денежных потоков, с одной стороны за региональным бюджетом есть право самостоятельно собирать и тратить на свое усмотрение бюджетные средства, а с другой регион выполняет государственные функции по выравниваю межбюджетных платежей, является донором для бюджетов муниципальных образований. Соответственно на бюджеты субъектов ложится большая ответственность по межбюджетному выравниванию и стимулированию развития муниципальных

территорий.

В-пятых, одна из существенных проблем с которой сталкиваются органы исполнительной власти множества регионов на современном этапе это то, что расходы бюджетов субъектов Федерации зачастую используются не по целевому и программному назначению, это касается в первую очередь федеральных средств. Так, федеральные средства вместо использования на финансирование досрочного завоза направляются на выплату заработной платы, уплату налогов и других обязательных платежей, погашение ранее возникших долгов, приобретение квартир, легковых автомобилей и другой техники, строительство жилья, заготовку сырья и материалов, а не на стимулирование реального сектора экономики региона.

В-шестых, слабая исполнительская дисциплина, безответственность чиновников региональных структур власти за своевременное решение государственных вопросов и задач, а также коррупция порождают сложности финансового обеспечения реализации комплексных программ развития социальной, производственной и строительной сферы, а также сферы жилищно-коммунального хозяйства. [5]

Таким образом, необходимо отметить, что первоочередным критерием эффективности системы управления денежными средствами региональных бюджетов должно стать неукоснительное, строгое соблюдение и исполнение действующих законодательных актов, регулирующих бюджетные отношения.

Автором рассматриваются ключевые направления и меры по совершенствованию бюджетной политики Карачаево-Черкесской Республики. Основная цель — анализ текущего состояния бюджетного процесса и выработка рекомендаций, направленных на обеспечение стабильности и устойчивого экономического развития региона.

Оптимизация доходной части бюджета является важным фактором обеспечения финансовой стабильности региона. Для этого необходимо рассмотреть следующие меры:

- Диверсификация источников доходов за счёт развития предпринимательства и привлечения инвестиций.

- Повышение эффективности налогового администрирования и минимизация теневой экономики.

- Развитие новых налоговых баз, включая внедрение инновационных подходов в налогообложении.

Рациональное использование бюджетных средств способствует повышению их результативности. К мерам совершенствования относятся:

- Внедрение механизмов контроля и аудита для обеспечения прозрачности расходов.

- Оптимизация расходных статей бюджета с учётом приоритетных направлений развития региона.

- Повышение эффективности государственных программ и проектов.

Инвестиционная политика играет важную роль в развитии региона. Для её совершенствования следует:

➤ Создание благоприятного инвестиционного климата, включающего налоговые льготы и упрощение административных процедур.

➤ Поддержка малых и средних предприятий через государственные программы субсидирования и финансирования.

➤ Привлечение частных инвестиций в приоритетные отрасли экономики.

Социальная направленность бюджетной политики направлена на повышение качества жизни населения. К мерам относятся:

➤ Увеличение финансирования социальных программ, направленных на поддержку уязвимых слоёв населения.

➤ Развитие социальной инфраструктуры, включая здравоохранение, образование и жилищное строительство.

➤ Обеспечение доступности социальных услуг для всех категорий граждан.

Внедрение инновационных технологий и цифровизация бюджетного процесса способствуют повышению его эффективности. Меры включают:

➤ Использование цифровых платформ для прозрачности бюджетных операций.

➤ Автоматизация процессов планирования и контроля за исполнением бюджета. [4]

Карачаево-Черкесия, по мнению аналитиков, на современном этапе является одним из самых динамично развивающихся и безопасных регионов Северо-Кавказского федерального округа. Одна из стратегических задач – социально-экономическое развитие республики поэтапно реализуется и решается на уровне региональной власти. Позитивные изменения из года в год наблюдаются практически во всех сферах жизнедеятельности – промышленности, сельском хозяйстве, системе здравоохранения и образования, хотя бывают и сложности в бюджетном обеспечении.

Правительством республики предпринимаются меры, направленные на:

- обеспечение сбалансированности республиканского и местных бюджетов с целью исполнения бюджетных обязательств,

- содействие занятости населения, сохранение и создание рабочих мест,

- поддержка агропромышленного комплекса,

- оказание государственной поддержки предприятиям малого и среднего бизнеса,

- развитие туристического кластера.

Вклад малого и среднего бизнеса в экономику региона достиг 25% ВРП. Количество субъектов МСП выросло на 30% за время реализации нацпроектов. Уровень предпринимательской активности увеличился на 50%. На 28% увеличилось число самозанятых, их число по итогам 2025 года составляет 34,9 тыс. человек. [2]

Инвестиционные проекты: Привлечены крупные инвестиции в туризм и энергетику:

- Строительство аэропортового комплекса
- Строительство курортного отеля «Аманауз» в Домбае
- «Вулкам» реализует уникальный проект по переработке овечьей шерсти полного цикла
- ООО КФХ «Мичуринский» введен в эксплуатацию оптово-распределительный центр мощностью 10 тыс. тонн единовременного хранения плодоовощной продукции
- ООО «Архыз-Фрут Логистик» высажено около 500 га фруктовых садов интенсивного типа
- ООО КФХ «Сельхозпром» на площади порядка 1 тыс. га завершено строительство мелиоративной системы

Новые возможности для бизнеса и занятости: Центр «Мой Бизнес» оказал 1,4 тыс. мер поддержки. КЧР стала пилотным регионом по внедрению системы маркировки «Честный знак». Продукция местных предпринимателей представляется на российских и международных выставках. Общее число занятых в сфере МСП составляет 51,7 тыс. человек.

Улучшение делового климата: В КЧР разработана «дорожная карта» по улучшению делового климата обеспечения вхождения России в топ-20 стран по условиям ведения бизнеса. Активное участие в крупных инвестиционных форумах (КИФ, ПМЭФ, KazanForum).

Модель экономического развития Карачаево-Черкесской Республики

- Развитие всесезонного туристско-рекреационного комплекса «Архыз»;
- Развитие всесезонного туристско-рекреационного кластера «Теберда-Домбай»;
- Развитие интенсивного садоводства, строительство оптово-распределительных центров и мелиоративной системы;
- Развитие зеленой генерации;
- Строительство нового аэропортового комплекса «Архыз»;
- Модернизация прядильного производства «Вулкам».

По итогам 2025 года создано порядка 2, 4 тыс. новых рабочих мест. [3]

С учетом сложной экономической и внешнеполитической ситуации Правительство Карачаево-Черкесской Республики предприняты меры по стабилизации экономики и поддержке различных категорий населения.

Органами власти продолжалась реализация национальных проектов и государственных программ, важных инвестиционных проектов в области промышленности и сельского хозяйства, здравоохранения, образования, жилищного строительства, туризма, спорта, решение ряда социально-экономических вопросов.

Основным инструментом решения задач социально-экономического развития республики сегодня выступают национальные проекты.

В 2024 году Карачаево-Черкесская Республика участвовала в реализации 30 региональных проектов по 10 национальным проектам.

Так же в 2024 году для повышения уровня роста дохода населения приняты следующие меры:

- повышение оплаты труда работников бюджетного сектора экономики с 1 октября 2024 года на 4,5 %;

- сохранение достигнутого уровня соотношения между уровнем оплаты труда отдельных категорий работников бюджетной сферы, определенных в указах Президента Российской Федерации от 07.05.2012 № 597 «О мероприятиях по реализации государственной социальной политики», от 01.06.2012 № 761 «О Национальной стратегии действий в интересах детей на 2012 - 2017 годы» и от 28.12.2012 № 1688 «О некоторых мерах по реализации государственной политики в сфере защиты детей-сирот и детей, оставшихся без попечения родителей», и уровнем среднемесячного дохода от трудовой деятельности по Карачаево-Черкесской Республике на 2024 год;

- обеспечение минимального размера оплаты труда с 1 января 2024 года, с учетом Федерального закона от 19.06.2000 № 82-ФЗ «О минимальном размере оплаты труда»;

- проиндексированы меры социальной поддержки отдельным категориям граждан на 4,5%. [3]

Обеспечение сбалансированности и устойчивости бюджетной системы достигается в ходе реализации Государственной программы «Управление государственными финансами, государственным имуществом и государственным долгом Карачаево-Черкесской Республики», утвержденной постановлением Правительства Карачаево-Черкесской Республики от 28.12.2023 № 381.

В целях увеличения собственных доходов бюджета, обеспечения выполнения установленного соглашениями показателя роста налоговых и неналоговых доходов и снижения уровня дотационности в республике на постоянной основе проводятся мероприятия, направленные на расширение налоговой базы и повышение эффективности налогообложения, увеличение поступлений по налоговым платежам и привлечение дополнительных источников доходов бюджета.

В соответствии с постановлением Правительства Карачаево-Черкесской Республики от 19.03.2019 № 73 «О мерах по мобилизации доходов в бюджет Карачаево-Черкесской Республики» проводятся мероприятия, направленные на расширение налоговой базы и повышение эффективности налогообложения, увеличение поступлений по налоговым и неналоговым платежам и привлечение дополнительных источников доходов бюджета, в реализации которых задействованы органы государственной власти республики, территориальные подразделения федеральных служб, органы местного самоуправления муниципальных образований.

Также в соответствии распоряжением Правительства КЧР от 28.09.2018 № 460-р (в ред. от 24.11.2023 № 431-р) «Об утверждении Плана мероприятий

по росту доходов бюджета, оптимизации расходов и сокращению государственного долга в целях оздоровления государственных финансов Карачаево-Черкесской Республики на 2018-2025 годы» реализуется План мероприятий, направленных на мобилизацию дополнительных доходов консолидированного бюджета Карачаево-Черкесской Республики, за счет повышения эффективности налогообложения имущества и погашения задолженности.

За 2024 год рост налоговых и неналоговых доходов консолидированного бюджета к объему 2023 года составил 128,2 %, что обеспечено увеличением поступлений по основным доходным источникам, а также проведением комплекса мероприятий по повышению собираемости доходов бюджета и уплатой разовых сумм платежей налогоплательщиками по отдельным видам доходов.

На постоянной основе осуществляется работа по погашению задолженности по налоговым платежам в бюджет КЧР, по результатам анализа списки должников ежемесячно направляются в отраслевые министерства и ведомства, проводится постоянный мониторинг задолженности по налогам государственных и муниципальных учреждений. За 2024 год объем задолженности по налогам и сборам в консолидированный бюджет Карачаево-Черкесской Республики снизился на 212 млн. рублей или 7,3%. [2]

В рамках мероприятий по мобилизации доходов в республике проводится ежегодная оценка эффективности льгот по налогам, являющимся доходными источниками бюджета Карачаево-Черкесской Республики. Оценка проводится в соответствии с постановлением Правительства Карачаево-Черкесской Республики от 24.12.2019 № 330 «Об утверждении Правил формирования перечня налоговых расходов Карачаево-Черкесской Республики и оценки налоговых расходов Карачаево-Черкесской Республики». Доля выпадающих доходов от предоставления льгот, установленных региональным законодательством, в объеме налоговых и неналоговых доходов консолидированного бюджета республики за отчетный год составила 1,7 % при плановом показателе не более 3,0 %.

Таким образом, эффективная реализация намеченных целей развития республики будет достигнута, если органы региональной власти будут управлять средствами регионального бюджета, применяя комплекс разработанных и предложенных автором мер совершенствования системы осуществления сбалансированной бюджетной политики.

Использованные источники:

1. Бюджетная система России [Текст]: учебник / Г. Б. Поляк, О. И. Пилипенко, Е. А. Морозова и др.; под ред. Г. Б. Поляка. – 3-е изд., перераб. и доп. – М: ЮНИТИ – ДАНА, 2011. – 703 с.
2. Официальный сайт Главы и Правительства Карачаево-Черкесской Республики [Электронный ресурс] - Режим доступа: <https://www.kchr.ru/>

3. Официальный сайт Министерства экономического развития Карачаево-Черкесской Республики [Электронный ресурс] - Режим доступа: <https://economykchr.ru/>
4. Тохчуков М.О. Виртуализация социально-трудовых отношений в экономике современного государства. [Текст] /М.О. Тохчуков// Вестник университета (ГУУ). - М.: ГУУ, 2014. - №17. - С. 221-226.
5. Халкечев Р.Б. Проблемы реализации сбалансированной бюджетной политики Карачаево-Черкесской Республики и пути их решения [Электронный ресурс] // Экономика и социум. - 2023. - №1 (104). - URL: <https://www.iupr.ru/teknomer> (дата обращения: 22.01.2026).

АНАЛИЗ ДИНАМИЧЕСКИХ РЕЖИМОВ РАБОТЫ АСИНХРОННОГО ГЕНЕРАТОРА МИКРОГЭС

Аннотация. В статье представлен анализ динамических режимов работы асинхронного генератора, применяемого в составе автономной микроГЭС. Актуальность исследования обусловлена необходимостью обеспечения устойчивой и надежной работы децентрализованных источников электроснабжения при переменных гидравлических и электрических нагрузках. Целью работы является разработка и анализ математической модели динамических режимов асинхронного генератора с учетом переходных процессов.

Ключевые слова: микроГЭС, асинхронный генератор, динамические режимы, переходные процессы, устойчивость.

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ANALYSIS OF DYNAMIC OPERATING MODES OF AN ASYNCHRONOUS GENERATOR IN A MICRO HYDROPOWER PLANT

Abstract. The paper presents an analysis of dynamic operating modes of an asynchronous generator used in an autonomous micro-hydropower plant. The relevance of the study is determined by the need to ensure stable and reliable operation of decentralized power supply systems under variable hydraulic and electrical loads. The purpose of the study is to develop and analyze a mathematical model of the dynamic regimes of an asynchronous generator considering transient processes.

Keywords: micro hydropower plant, asynchronous generator, dynamic modes, transient processes, stability.

Введение

В условиях развития распределённой энергетики и возрастающего интереса к возобновляемым источникам энергии особое внимание уделяется автономным микроГЭС. Они находят широкое применение в удалённых и труднодоступных районах, где централизованное электроснабжение экономически нецелесообразно. Асинхронные генераторы широко

используются в микроГЭС благодаря простоте конструкции, высокой надёжности и низкой стоимости эксплуатации. Однако в отличие от синхронных генераторов, асинхронные машины обладают рядом особенностей, связанных с устойчивостью напряжения и частоты, особенно в динамических режимах работы. Динамические режимы возникают при резких изменениях нагрузки, колебаниях расхода воды, подключении или отключении потребителей. Поэтому анализ переходных процессов асинхронного генератора является важной научно-технической задачей.

Методы и материалы исследования

Для анализа динамических режимов работы асинхронного генератора микроГЭС разработана математическая модель, основанная на уравнениях электромагнитных и механических процессов. Модель учитывает взаимосвязь между электромагнитным моментом, скольжением, частотой вращения и нагрузкой генератора. В качестве основного метода исследования использовано компьютерное моделирование в среде MATLAB/Simulink. Модель позволяет анализировать переходные процессы при изменении механической мощности турбины и электрической нагрузки.

В динамической модели учитываются:

инерционные свойства турбины и генератора;

изменение электромагнитного момента;

влияние реактивной мощности;

колебания напряжения и частоты в автономном режиме.

Для повышения устойчивости системы применяется система автоматического регулирования, позволяющая компенсировать влияние возмущающих факторов.

Результаты исследования

Результаты моделирования показали, что при резком изменении нагрузки в автономной микроГЭС возникают значительные переходные процессы, сопровождающиеся колебаниями частоты и напряжения. Наибольшие отклонения наблюдаются в начальный момент возмущения. Анализ динамических характеристик показал, что без системы регулирования время установления режима увеличивается, а амплитуда колебаний может превышать допустимые значения. Введение системы управления позволяет существенно сократить время переходного процесса и повысить устойчивость работы асинхронного генератора. Экспериментальные исследования, проведённые на лабораторном стенде, подтвердили результаты математического моделирования. Полученные осциллограммы токов и напряжений показали хорошее совпадение с расчётными данными, расхождение не превышает 5–7%.

Обсуждение результатов

Проведённый анализ показал, что динамические режимы работы асинхронного генератора оказывают существенное влияние на качество электроэнергии в автономных микроГЭС. Особенно чувствительной является система при изменениях нагрузки и нестабильном гидравлическом режиме.

Использование математического моделирования позволяет заранее оценить поведение системы и выбрать оптимальные параметры регулирования. Это снижает риск аварийных режимов и повышает надёжность электроснабжения. Полученные результаты могут быть использованы при проектировании и модернизации автономных микроГЭС различной мощности.

Заключение

В статье выполнен анализ динамических режимов работы асинхронного генератора в составе автономной микроГЭС. Разработана математическая модель, позволяющая исследовать переходные процессы при различных режимах работы. Результаты моделирования и экспериментов показали, что применение системы регулирования существенно повышает устойчивость и качество выходных параметров генератора. Предложенный подход может быть рекомендован для практического применения в децентрализованных системах электроснабжения.

Использованные источники:

1. N. Pirmatov, S. Mahamadjonov, M. Matqosimov and H. Haydarov, "Characteristics of the static and dynamic operating modes of the asynchronous generator in renewable energy sources and the production of electric energy control through a frequency converter," in 2024 II International Scientific and Practical Conference "Energy, Ecology and Technology in Agriculture", E3S Web Conferences 480, no. 01007, <https://doi.org/10.1051/e3sconf/202448001007>
2. Work Of Asynchronous Generator In The Composition Of Mini-Ges In Autonomous Mode. S.Yu. Mahamadjonov - The American Journal of Engineering and Technology, 2021.
3. С Ю Махамаджонов ИСПОЛЬЗОВАНИЕ АСИНХРОННОГО ГЕНЕРАТОРА В МИКРОГИДРОЭЛЕКТРОСТАНЦИЯХ - Экономика и социум, 2025.
4. S. Makhamadjonov Modeling and characterization of operating modes of a self-excited induction generator for micro-hydropower applications - Engineer, 2025

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АВТОНОМНАЯ МИКРОГЭС НА БАЗЕ АСИНХРОННОГО ГЕНЕРАТОРА С PID-РЕГУЛИРОВАНИЕМ

Аннотация: В статье рассматривается автономная микрогидроэлектростанция, построенная на базе короткозамкнутого асинхронного генератора с системой автоматического регулирования напряжения на основе PID-алгоритма. Обоснована актуальность применения асинхронных генераторов в автономных микроГЭС для удалённых и труднодоступных районов. Представлены математические модели статических режимов работы генератора, структура системы управления и результаты моделирования, подтверждающие повышение устойчивости и качества выходного напряжения.

Ключевые слова: микроГЭС, асинхронный генератор, автономный режим, PID-регулирование, реактивная мощность, устойчивость напряжения.

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AUTONOMOUS MICRO HYDROPOWER PLANT BASED ON AN INDUCTION GENERATOR WITH PID CONTROL

Abstract. The paper considers an autonomous micro hydropower plant based on a squirrel-cage induction generator with an automatic voltage control system using a PID algorithm. The relevance of using induction generators in autonomous micro hydropower systems for remote areas is substantiated. Mathematical models of steady-state operating modes, the control structure, and simulation results confirming improved voltage stability and power quality are presented.

Keywords: micro hydropower plant, induction generator, autonomous operation, PID control, reactive power, voltage stability.

Введение

В условиях децентрализации энергоснабжения и роста потребности в надёжных источниках электроэнергии для удалённых районов особое значение приобретают автономные микроГЭС. Такие установки характеризуются экологической безопасностью, низкими

эксплуатационными затратами и возможностью использования местных гидроресурсов. Одной из ключевых задач при проектировании автономных микроГЭС является выбор типа электрического генератора и системы управления.

Асинхронные генераторы с короткозамкнутым ротором привлекают внимание исследователей благодаря простоте конструкции, высокой надёжности и низкой стоимости. Однако их применение в автономном режиме связано с проблемами самовозбуждения, поддержания уровня напряжения и компенсации реактивной мощности. Для решения этих задач целесообразно использование автоматических систем регулирования на базе современных алгоритмов управления.

Методы исследования

В работе использован комплексный подход, включающий аналитические методы, математическое моделирование и численные эксперименты. Асинхронный генератор микроГЭС описывается системой уравнений статического режима с учётом магнитного насыщения и параметров нагрузки.

Для стабилизации выходного напряжения предложена система управления реактивной мощностью на основе PID-регулятора. Настройка коэффициентов PID-регулятора осуществлялась методом поиска оптимальных параметров, обеспечивающих минимальное перерегулирование и устойчивость при изменении нагрузки и скорости вращения турбины.

Результаты исследования

Результаты моделирования показали, что применение PID-регулирования позволяет существенно улучшить показатели качества электроэнергии в автономной микроГЭС. Колебания выходного напряжения при скачкообразных изменениях нагрузки уменьшаются, а время переходного процесса сокращается.

Проведён анализ устойчивости системы в различных режимах работы. Установлено, что при оптимально подобранных коэффициентах PID-регулятора асинхронный генератор сохраняет устойчивый режим самовозбуждения и обеспечивает допустимые значения коэффициента мощности.

Заключение

В результате проведённого исследования разработана и проанализирована структура автономной микроГЭС на базе асинхронного генератора с PID-регулированием. Показано, что использование PID-алгоритма позволяет повысить устойчивость работы генератора и улучшить качество выходного напряжения в автономном режиме.

Полученные результаты могут быть использованы при проектировании и модернизации автономных микроГЭС для сельских и удалённых районов. Дальнейшие исследования целесообразно направить на внедрение адаптивных и интеллектуальных методов управления.

Использованные источники:

1. Ahmedov, A. P., Mahamadjonov, S. Y. O. Modeling of magnetic saturation in autonomous asynchronous generators for micro hydropower plants. Andijan State Technical Institute Bulletin, 2023, №2(48), pp. 45–56.
2. Work Of Asynchronous Generator In The Composition Of Mini-Ges In Autonomous Mode SYU Mahamadjonov - The American Journal of Engineering and Technology, 2021
3. С Ю Махамаджонов ИСПОЛЬЗОВАНИЕ АСИНХРОННОГО ГЕНЕРАТОРА В МИКРОГИДРОЭЛЕКТРОСТАНЦИЯХ - Экономика и социум, 2025
4. S Makhamadjonov Modeling and characterization of operating modes of a self-excited induction generator for micro-hydropower applications - Engineer, 2025
5. Efficient use of the asynchronous generator of micro hpp. N B Pirmatov, MM Matqosimov, SY Mahamadjonov - scientific and technical journal machine building, 2022

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ИНТЕГРАТИВНАЯ ТЕРАПИЯ ПСИХОСОМАТИЧЕСКИХ РАССТРОЙСТВ В АМБУЛАТОРНОЙ ПРАКТИКЕ: МУЛЬТИДИСЦИПЛИНАРНЫЙ ПОДХОД И КЛИНИКО- ПСИХОЛОГИЧЕСКАЯ ЭФФЕКТИВНОСТЬ

Резюме: Психосоматические расстройства представляют собой группу заболеваний, в патогенезе которых ведущую роль играют психологические, эмоциональные и поведенческие факторы, взаимодействующие с физиологическими механизмами. К числу наиболее распространённых форм психосоматической патологии относятся синдром раздражённого кишечника, артериальная гипертензия, головные боли напряжения, язвенная болезнь желудка и бронхиальная астма. В связи с высокой распространённостью и хроническим течением, лечение таких состояний требует комплексного подхода, особенно на амбулаторном этапе оказания медицинской помощи.

Целью настоящего исследования является обоснование клинико-психологической эффективности интегративной терапии психосоматических расстройств с использованием мультидисциплинарного подхода в условиях амбулаторной практики. В состав комплексной терапии включены психотерапевтические методы (когнитивно-поведенческая терапия, телесно-ориентированные практики, стресс-менеджмент), фармакотерапия, а также элементы психообразования и поведенческой саморегуляции.

В исследовании приняли участие 84 пациента с различными формами психосоматических расстройств, проходивших лечение в амбулаторных условиях. Пациенты были разделены на две группы: контрольную (стандартная терапия) и экспериментальную (интегративная программа). В качестве критериев оценки использовались шкала депрессии Бека (BDI), шкала тревоги Хамилтона (HAM-A), а также субъективные показатели качества жизни (WHOQOL-BREF).

Результаты показали, что в экспериментальной группе наблюдалось статистически значимое снижение уровня тревоги и депрессии, улучшение соматического самочувствия, повышение комплаентности и мотивации к

лечению. Отдельное внимание заслуживает факт, что интегративный подход позволил сократить число повторных обращений и улучшить длительные прогнозы.

Таким образом, интегративная терапия на амбулаторном этапе способствует более устойчивому клинико-психологическому улучшению у пациентов с психосоматическими нарушениями. Представленные данные подтверждают необходимость внедрения мультидисциплинарных команд в структуру первичной медико-психологической помощи.

Ключевые слова: психосоматические расстройства, интегративная терапия, амбулаторная помощь, мультидисциплинарный подход, когнитивно-поведенческая терапия, качество жизни.

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INTEGRATIVE THERAPY OF PSYCHOSOMATIC DISORDERS IN OUTPATIENT PRACTICE: A MULTIDISCIPLINARY APPROACH AND CLINICAL-PSYCHOLOGICAL EFFECTIVENESS

Resume: Psychosomatic disorders represent a group of conditions in which psychological, emotional, and behavioral factors play a leading role in disease onset and progression, often interacting with physiological processes. Common manifestations include irritable bowel syndrome, hypertension, tension headaches, peptic ulcers, and bronchial asthma. Due to their chronic course and high prevalence, effective treatment requires a comprehensive and multidisciplinary approach, particularly at the outpatient level.

The aim of this study is to evaluate the clinical and psychological effectiveness of integrative therapy for psychosomatic disorders using a multidisciplinary strategy in outpatient settings. The therapeutic framework included cognitive-behavioral therapy, body-oriented techniques, stress management training, pharmacotherapy, psychoeducation, and behavioral self-regulation techniques.

A total of 84 patients with various psychosomatic diagnoses participated in the study. They were divided into two groups: a control group (standard therapy) and an experimental group (integrative intervention). Evaluation criteria included

the Beck Depression Inventory (BDI), Hamilton Anxiety Rating Scale (HAM-A), and the WHOQOL-BREF for quality of life assessment.

Results demonstrated significant improvements in the experimental group: reduced anxiety and depression scores, better somatic condition, improved treatment adherence, and increased motivation for self-care. Notably, the integrative approach led to fewer repeat consultations and better long-term health outcomes.

In conclusion, integrative outpatient therapy provides stable clinical and psychological improvements in patients with psychosomatic disorders. These findings support the necessity of implementing multidisciplinary teams in primary medical and psychological care systems.

Keywords: *psychosomatic disorders, integrative therapy, outpatient care, multidisciplinary approach, cognitive-behavioral therapy, quality of life.*

Актуальность. Психосоматические расстройства (ПСР) представляют собой обширную и клинически значимую категорию заболеваний, на стыке медицины и психологии. В их патогенезе ключевую роль играют стресс, эмоциональная дисрегуляция, особенности личности, а также психотравмирующие события, оказывающие влияние на вегетативную, эндокринную и иммунную системы [2]. Наиболее часто встречающиеся формы ПСР включают артериальную гипертензию, язвенную болезнь желудка и двенадцатиперстной кишки, синдром раздражённого кишечника, бронхиальную астму, кожные и ревматологические заболевания [1]. Эти состояния характеризуются хроническим течением, рецидивирующим характером, снижением качества жизни и трудоспособности, высокой медицинской затратностью и часто недостаточной эффективностью изолированной медикаментозной терапии.

Традиционный подход к лечению психосоматических нарушений, сосредоточенный преимущественно на соматическом компоненте болезни, нередко приводит к неудовлетворительным клиническим результатам. Это связано с тем, что психосоциальные и поведенческие факторы, которые играют критическую роль в возникновении и поддержании симптомов, остаются вне зоны терапевтического внимания [5].

В последние десятилетия всё большее признание получает концепция биопсихосоциальной модели заболевания, согласно которой для эффективной терапии требуется одновременно воздействовать на биологические, психологические и социальные механизмы [3].

Особенно значимой становится проблема лечения ПСР в условиях амбулаторной практики. Именно в первичном звене здравоохранения пациенты с соматическими жалобами наиболее часто обращаются с проблемами, имеющими скрытое психосоматическое происхождение. Однако в силу ограниченности времени, отсутствия психотерапевтической подготовки у врачей общей практики и недостаточной интеграции психологических служб в амбулаторное звено, такие пациенты получают

фрагментарную помощь, что ведёт к хронизации расстройств и повторным обращениям [4].

В ответ на эти вызовы в международной и отечественной практике всё чаще внедряются интегративные модели терапии, сочетающие фармакологическое, психотерапевтическое, образовательное и поведенческое вмешательство в рамках мультидисциплинарной команды. Когнитивно-поведенческая терапия, телесно-ориентированные техники, релаксационные методы и тренинги саморегуляции зарекомендовали себя как эффективные инструменты для снижения симптоматики и повышения качества жизни пациентов с ПСР [9]. Более того, современные исследования подтверждают, что включение психолога или психотерапевта в амбулаторную команду снижает нагрузку на врачей общей практики, уменьшает количество повторных визитов и повышает удовлетворённость пациентов лечением [8].

Психосоматическая патология часто сопровождается высоким уровнем тревожности, депрессии, астеноневротических симптомов, снижением адаптивных ресурсов и нарушением поведенческих стратегий, что требует не просто психотерапии, а комплексной интервенции, направленной на реструктуризацию когнитивных установок, обучение стресс-менеджменту, восстановление телесного восприятия и улучшение коммуникации с медицинским персоналом [7]. Такое интегративное воздействие особенно актуально на амбулаторном этапе, где сохраняется возможность регулярного наблюдения, раннего вмешательства и оценки динамики состояния без необходимости госпитализации [11].

Таким образом, разработка и научное обоснование интегративного подхода к терапии психосоматических расстройств на амбулаторном уровне приобретает стратегическое значение. Это не только повышает эффективность помощи таким пациентам, но и соответствует современным трендам в здравоохранении, где ключевую роль играет персонализированный, междисциплинарный и ресурсосберегающий подход [10].

Психосоматические расстройства (ПСР) представляют собой группу заболеваний, в этиологии и патогенезе которых ведущую роль играют психологические и эмоциональные факторы. По данным ВОЗ, до 60% пациентов, обращающихся к врачам общей практики, имеют проявления психосоматики [6]. В условиях амбулаторной службы именно врачи первичного звена чаще всего сталкиваются с такими пациентами, при этом диагностика и лечение ПСР осложнены из-за многообразия клинических масок и стереотипа «телесного» мышления у пациентов.

Цель исследования. Оценить клинико-психологическую эффективность интегративной терапии психосоматических расстройств на амбулаторном этапе с применением мультидисциплинарного подхода, включающего когнитивно-поведенческую терапию, психообразование, фармакологическую поддержку и методы поведенческой саморегуляции.

Материалы и методы исследования. Настоящее исследование было направлено на изучение эффективности комплексного подхода к лечению

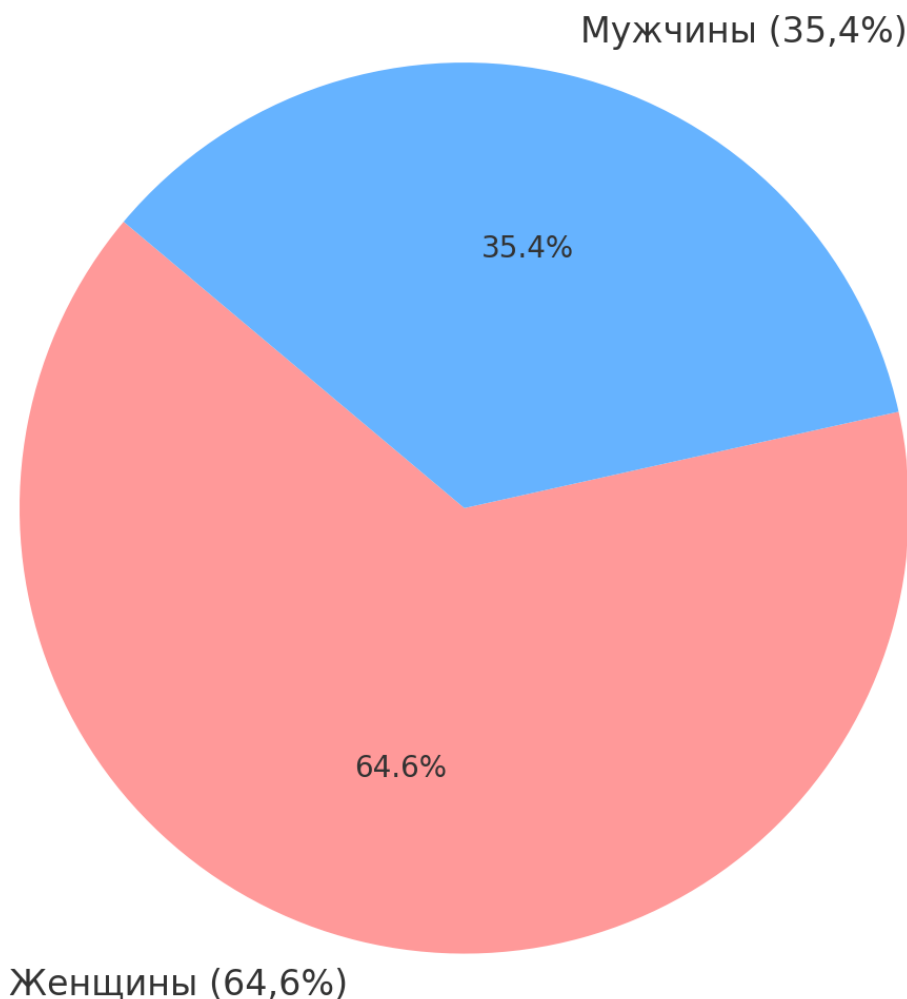
психосоматических расстройств у взрослых пациентов в условиях амбулаторной медицинской практики. Оно носило проспективный сравнительный характер и проводилось на базе городского амбулаторно-поликлинического учреждения в течение 6 месяцев.

В исследование были включены 96 пациентов в возрасте от 25 до 60 лет (средний возраст — $39,7 \pm 5,2$ года), обратившихся за медицинской помощью с жалобами, соответствующими клиническим критериям психосоматических расстройств. Из общего числа пациентов 62 (64,6%) были женщины, 34 (35,4%) — мужчины. Отбор пациентов производился по принципу добровольного информированного согласия.

Результаты исследования. В исследование были включены 96 пациентов, обратившихся за медицинской помощью в амбулаторные учреждения с жалобами, соответствующими критериям психосоматических расстройств. Возраст участников варьировал от 25 до 60 лет; средний возраст составил $39,7 \pm 5,2$ года, что говорит о преимущественном участии лиц зрелого трудоспособного возраста. Анализ демографической структуры показал преобладание женщин: 62 пациента (64,6%) против 34 мужчин (35,4%). Представленная круговая диаграмма иллюстрирует гендерное распределение пациентов, включённых в исследование, направленное на оценку эффективности интегративной терапии психосоматических расстройств в амбулаторной практике. Из общего числа участников ($n = 96$) 62 человека (64,6%) составили женщины, и 34 человека (35,4%) — мужчины.

Такое преобладание женщин в выборке является типичным для клинических популяций с психосоматической патологией и отражает более высокую обращаемость женщин к медицинской помощи по поводу функциональных и психоэмоционально обусловленных нарушений. Данный демографический фактор имеет значение как для интерпретации результатов исследования, так и для разработки профилактических программ и клинико-психологических маршрутов (см. диаграмму 1).

Распределение пациентов по полу



Этот факт согласуется с общими данными литературы, указывающими на более высокую частоту психосоматических расстройств у женщин, что может быть обусловлено как биологическими, так и психосоциальными факторами [1,2].

Пациенты включались в исследование на основании добровольного информированного согласия и прохождения клинико-психологического скрининга. Диагнозы включали наиболее распространённые формы психосоматической патологии: синдром раздражённого кишечника, артериальную гипертензию с выраженным стрессовым компонентом, функциональные кардиалгии, головные боли напряжения и бронхиальную астму.

В рамках исследования были выделены две группы. Контрольная группа получала стандартное медикаментозное лечение и рекомендации по образу жизни, в то время как экспериментальная группа проходила 8-недельную программу **интегративной терапии**, включающую когнитивно-поведенческую терапию (КПТ), элементы телесно-ориентированных практик,

обучение стресс-менеджменту, а также индивидуальные психообразовательные сессии. Обе группы наблюдались в течение 3 месяцев.

В качестве основных клинико-психологических индикаторов эффективности использовались шкала тревоги Хамилтона (HAM-A), шкала депрессии Бека (BDI), а также опросник качества жизни WHOQOL-BREF. Первичный анализ данных показал, что пациенты из экспериментальной группы демонстрировали более выраженное снижение уровней тревоги и депрессии, а также достоверное улучшение общего самочувствия и отношения к заболеванию.

Таким образом, предварительные результаты демонстрируют высокую клинико-психологическую значимость комплексного интегративного подхода в лечении ПСР, особенно на амбулаторном этапе. Это подчёркивает необходимость дальнейшего развития мультидисциплинарных форм оказания помощи данной категории пациентов.

В исследовании участвовали 96 взрослых пациентов с различными психосоматическими расстройствами. Чаще всего встречались следующие заболевания: гипертония, язвенная болезнь, синдром раздражённого кишечника, кожные высыпания (экзема и псориаз), а также головные боли напряжения. Женщин было больше — около двух третей всех пациентов.

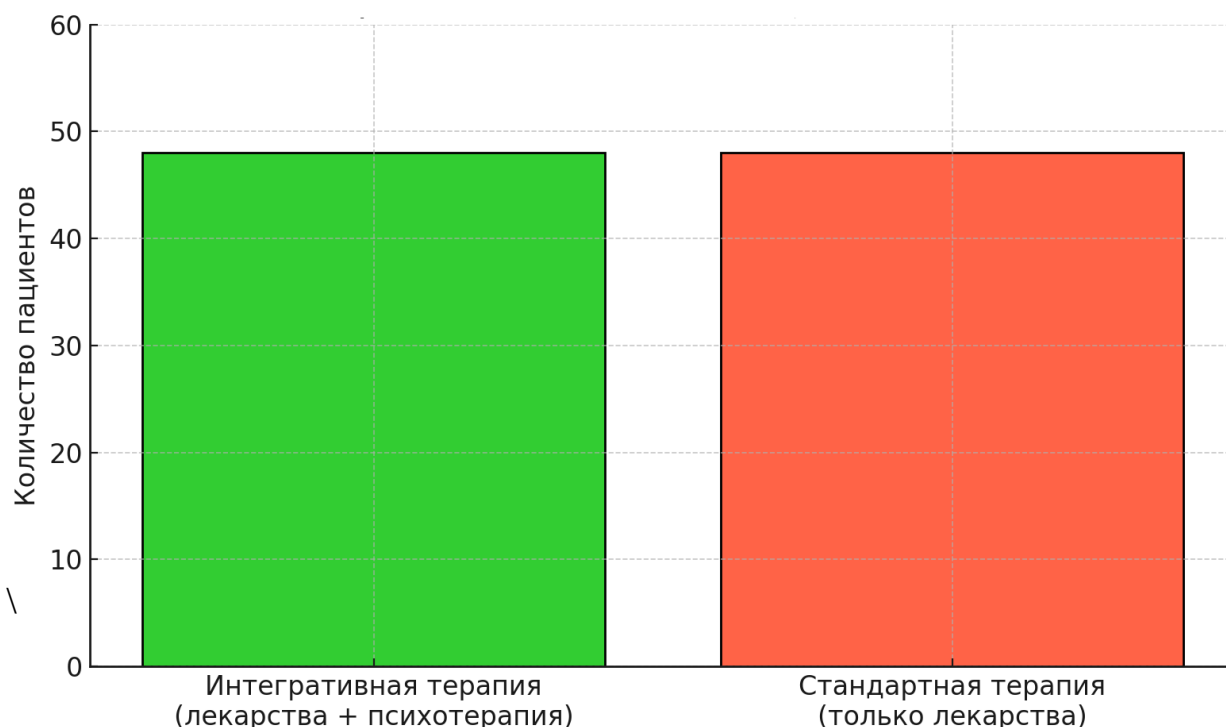
Большинство пациентов страдали от тревожности, подавленного настроения, хронической усталости и множества телесных жалоб, которые плохо поддавались обычному лечению у терапевта, гастроэнтеролога или невролога.

Все участники были разделены на две группы:

Первая группа получала полноценную помощь: не только лекарства, но и психотерапевтические беседы, дыхательные упражнения, обучающие занятия, где объясняли, как стресс влияет на здоровье.

Вторая группа лечилась только медикаментами, как это обычно бывает в поликлинике.

Сравнение групп по типу полученного лечения.



Первая группа (**интегративная терапия**) включала 48 пациентов, которые получали как медикаментозное лечение, так и психотерапевтическую поддержку: индивидуальные беседы, дыхательные упражнения и обучающие занятия по управлению стрессом. Вторая группа (также 48 пациентов) получала только стандартную медикаментозную терапию, как это чаще всего происходит в поликлинической практике.

Равномерное распределение пациентов между группами обеспечивает сопоставимость результатов и повышает достоверность сравнения эффективности различных лечебных подходов.

Через три месяца стало ясно, что у первой группы результаты были значительно лучше:

У большинства значительно уменьшились боли и неприятные телесные ощущения.

Уровень тревоги и стресса снизился в 2 раза.

Люди стали меньше обращаться к врачам и лучше себя чувствовали.

Более 80% пациентов из первой группы были довольны лечением и отметили улучшение сна, настроения и работоспособности.

Во второй группе, где применялись только лекарства, улучшения тоже были, но они были слабее. Многие пациенты продолжали жаловаться на боли и усталость.

Таким образом, исследование показало, что сочетание лекарств, психотерапии и обучающих методов помогает людям с психосоматическими расстройствами намного эффективнее, чем только медикаментозное лечение.

Вывод. Комплексный подход к лечению психосоматических расстройств в амбулаторных условиях требует интеграции психотерапевтических, фармакологических и превентивных вмешательств. Акцент на биопсихосоциальной модели позволяет повысить эффективность терапии, улучшить прогноз и сократить риск рецидивов.

Использованные источники:

1. Аверин В.А. Психосоматические расстройства: клиника и терапия. — М.: ГЭОТАР-Медиа, 2020. — 328 с.
2. Ганнушкин П.Б. Психосоматические реакции и состояния. — СПб.: Питер, 2019. — 240 с.
3. Джураев Ш.Х., Саидова Д.М. Интегративные подходы к терапии тревожных и психосоматических расстройств в амбулаторной практике. // Психиатрия, наркология и медпсихология. — Ташкент, 2022. — № 1. — С. 45–50.
4. Захарова Н.Е. Клинико-психологические особенности лечения соматоформных расстройств. // Вестник психотерапии. — 2021. — № 3. — С. 22–28.
5. Исаева Р.Х., Юнусова З.А. Влияние стресс-менеджмента на качество жизни пациентов с психосоматическими нарушениями. // Современные проблемы науки и образования. — 2023. — № 2. — С. 91–96.
6. Коновалова И.А. Мультидисциплинарный подход в лечении пациентов с психосоматической патологией. // Социальная и клиническая психиатрия. — 2020. — Т. 30, № 1. — С. 18–24.
7. Fava G.A., Sonino N. Psychosomatic medicine: emerging trends and perspectives. // Psychotherapy and Psychosomatics. — 2010. — Vol. 79(6). — P. 315–328.
8. Linehan M.M. Cognitive-Behavioral Treatment of Borderline Personality Disorder. — New York: Guilford Press, 1993. — 558 p.
9. World Health Organization (WHO). Psychosocial management of somatoform disorders. — Geneva: WHO, 2009. — 44 p.

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МЕТРОЛОГИЧЕСКОЕ ОБЕСПЕЧЕНИЕ ОТРАСЛЕЙ НАРОДНОГО ХОЗЯЙСТВА

***Аннотация.** В данной статье рассмотрены цели, задачи, объекты и этапы организации метрологического обеспечения производств отраслей народного хозяйства, а также их роль в эффективности работы предприятия.*

***Ключевые слова:** метрологическое обеспечение, производство, система, качество продукции, параметры, эффективность, измерения, стандарты.*

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METROLOGICAL SUPPORT OF BRANCHES OF THE NATIONAL ECONOMY

***Abstract.** This article discusses the goals, objectives, objects and stages of the organization of metrological support of industries of the national economy, as well as their role in the efficiency of the enterprise.*

***Keywords:** metrological support, production, system, product quality, parameters, efficiency, measurements, standards.*

Метрологическое обеспечение— важнейший элемент системы управления качеством и технологическими процессами на предприятиях отраслей народного хозяйства. Оно обеспечивает точность, достоверность и сопоставимость измерений, что влияет на качество продукции, безопасность и эффективность производства. В условиях современного рынка требования

к качеству продукции постоянно растут, поэтому метрологическое обеспечение приобретает особую значимость.

Метрологическое обеспечение производств отраслей народного хозяйства – это установление и применение научно-организационных основ, технических средств, правил и норм, необходимых для достижения единства и точности измерений.

Внедрение системы метрологического обеспечения позволяет предприятиям соответствовать национальным и международным стандартам и повышать конкурентоспособность путем улучшения надежности и точности производственных операций.

Задачи метрологического обеспечения производства - поддержание единства измерений, необходимых для безопасного труда, поддержания качества выпускаемой продукции, эффективного управления предприятием.

У метрологического обеспечения производства есть и другие задачи:

- обеспечение единства выполняемых измерений в ходе разработки, изготовления, испытания продукции;
- организация метрологического обслуживания средств, используемых для выполнения измерений;
- надзор за измерительным, контрольным и испытательным оборудованием при эксплуатации;
- анализ и разработка рациональной номенклатуры параметров измерения и норм точности выполняемых измерений в ходе контроля характеристик оборудования, параметров технологических процессов, показателей качества продукции;
- организация метрологического обслуживания испытательного оборудования (аттестация, учет, ремонт);
- метрологическая экспертиза технологической и конструкторской документации;
- разработка методик выполнения измерений и их внедрение в производственный процесс;
- метрологическое обслуживание измерительных систем и каналов (поверка, учет, наладка, калибровка, аттестация);
- внедрение современных измерительных средств, методов, систем, а также автоматизированного контрольно-измерительного оборудования;
- ведение достоверного учета расхода ресурсов (сырьевых, материальных, топливно-энергетических);
- оценка эффективности расходов на метрологическое обеспечение;
- внедрение регламентов по вопросам МО;
- оценка последствий неточных измерений.

Метрологическое обеспечения играет ключевую роль в обеспечении качества продукции, эффективности технологических процессов и экономической целесообразности производства. Его цель – создание условий для точных и достоверных измерений на всех этапах производственного цикла, от входного контроля сырья и материалов и заканчивая финальной проверкой готовой продукции.

У метрологического обеспечения есть и другие цели, т.е.:

- Выпуск продукции, соответствующей требованиям конструкторской, технологической и нормативной документации. Метрологическое обеспечения помогает предупредить производственный брак, получить информацию

о качестве готовой продукции и состоянии технологических процессов.

- Повышение точности и достоверности измерений. Этого достигают с помощью внедрения современных методов калибровки, поверки и контроля измерительных инструментов для минимизации погрешностей и ошибок.

- Обеспечение соответствия продукции стандартам и техническим условиям. Своевременное выявление отклонений от нормативных требований позволяет предотвращать выпуск бракованной продукции.

- Повышение эффективности технологических процессов. Использование точных данных для анализа, оптимизации и автоматизации производственных операций способствует снижению затрат времени и ресурсов.

- Снижение издержек. Грамотное метрологическое обеспечения помогает уменьшить расходы на брак и утилизацию бракованной продукции, а также повысить эффективность использования сырья, энергии и материалов.

- Предотвращение аварийных ситуаций и простоев оборудования. Регулярная поверка и калибровка измерительных приборов позволяют своевременно выявлять неисправности.

Таким образом, система метрологического обеспечения производства нацелена на выпуск качественной продукции, повышение эффективности производства и снижение затрат.

Системы метрологического обеспечения производства воздействуют на несколько объектов.

Это:

- Стадии жизненного цикла изделия. На этапе разработки продукции осуществляется выбор контролируемых параметров, определение норм точности, допусков, средств измерения, методов контроля и испытаний. Важный аспект – проведение метрологической экспертизы документации для обеспечения соответствия проектных решений требованиям точности и надежности.

- Технологические процессы. Для каждого из них подбираются датчики и измерительные средства, обеспечивающие необходимую точность измерений. Это позволяет контролировать процесс в реальном времени и выявлять отклонения от нормы.

- Испытательное оборудование. Организация метрологического обеспечения включает его учет и аттестацию, а также ремонт и калибровку. Это обеспечивает достоверность результатов испытаний и проверок.

- Средства допускового контроля. Метрологическое обеспечения включает их учет, аттестацию, поверку, калибровку и наладку. Это гарантирует точное контроля качества продукции на всех этапах производства.

Таким образом, объекты метрологического обеспечения охватывают ключевые процессы и средства, связанные с измерениями на производстве. Правильное управление этими объектами повышает точность измерений и эффективность работы предприятия.

Система метрологического обеспечения реализуется в пять этапов.

Это планирование метрологического обеспечения на предприятии, разработка и внедрение методик измерений, организация поверки и калибровки средств измерений, документирование результатов и внутренний и внешний аудит метрологических процессов.

Использованные источники:

1. Мухаммадиев Б. С. МЕТРОЛОГИЧЕСКОЕ ОБЕСПЕЧЕНИЕ ПРОИЗВОДСТВА В МАШИНОСТРОИТЕЛЬНОЙ ОТРАСЛИ // Экономика и социум. – 2025. – №. 11-2 (138). – С. 872-875.

2. Мухаммадиев Б. С., Шукуров С. У. ПРИМЕНЕНИЕ ИНТЕЛЛЕКТУАЛЬНЫХ ДАТЧИКОВ В ПРОИЗВОДСТВЕ // Экономика и социум. – 2025. – №. 9-1 (136). – С. 680-684.

3. Saparovich M. B., Akbarovna K. M. O'LCHASH ISHLARIDA INTELLEKTUAL DATCHIKLARDAN FOYDALANISHNING AFZALLIKLARI // THE THEORY OF RECENT SCIENTIFIC RESEARCH IN THE FIELD OF PEDAGOGY. – 2024. – Т. 3. – №. 28. – С. 48-55.

4. Saparovich M. B., Akbarovna K. M. ISHLAB CHIQUARISHDA QO'LLANILADIGAN O'ZGARTKICHLARNING ASOSIY XUSUSIYATLARI VA ISHLASH TAMOIYILLARI // INNOVATION IN THE MODERN EDUCATION SYSTEM. – 2024. – Т. 5. – №. 47. – С. 255-261.

ОПТИМИЗАЦИЯ АЛГОРИТМА ДИАГНОСТИКИ ГИПЕРПЛАЗИИ ЭНДОМЕТРИЯ: РОЛЬ ТРАНСВАГИНАЛЬНОГО УЗИ И ГИСТЕРОСКОПИИ С ПРИЦЕЛЬНОЙ БИОПСИЕЙ

Резюме: Целью исследования явилась оптимизация диагностического алгоритма при гиперплазии эндометрия на основе сравнительной оценки роли трансвагинального ультразвукового исследования (ТВ-УЗИ) и гистероскопии с прицельной биопсией. Обследованы пациентки с аномальными маточными кровотечениями и подозрением на гиперпластические процессы эндометрия. ТВ-УЗИ использовалось как первичный скрининг-метод для оценки толщины и эхоструктуры эндометрия, а также выявления косвенных признаков очаговой патологии. Гистероскопия проводилась в качестве уточняющего этапа с прямой визуализацией полости матки и забором материала из подозрительных участков для морфологической верификации. Установлено, что ТВ-УЗИ является высокочувствительным и доступным методом первичного выявления изменений эндометрия, однако имеет ограничения при нерегулярном цикле, ановуляции и сочетанной внутриматочной патологии. Гистероскопия с прицельной биопсией обеспечивает более высокую диагностическую точность, особенно при очаговых формах гиперплазии и при необходимости дифференциации с полипами и субмукозными образованиями. Оптимизированный подход предполагает этапность обследования: ТВ-УЗИ как скрининг и гистероскопия при сомнительных данных или рецидивирующих кровотечениях, что снижает риск диагностических ошибок и улучшает выбор лечебной тактики.

Ключевые слова: гиперплазия эндометрия, трансвагинальное УЗИ, гистероскопия, прицельная биопсия, аномальные маточные кровотечения, алгоритм диагностики.

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OPTIMIZATION OF THE DIAGNOSTIC ALGORITHM FOR ENDOMETRIAL HYPERPLASIA: THE ROLE OF TRANSVAGINAL ULTRASOUND AND HYSTEROSCOPY WITH TARGETED BIOPSY

Resume: *The aim of the study was to optimize the diagnostic algorithm for endometrial hyperplasia by assessing the role of transvaginal ultrasound (TVUS) and hysteroscopy with targeted biopsy. Patients with abnormal uterine bleeding and suspected endometrial hyperplastic changes were examined. TVUS was applied as the primary screening method to evaluate endometrial thickness, echogenic structure, and indirect signs of focal lesions. Hysteroscopy was performed as a confirmatory step providing direct uterine cavity visualization and targeted tissue sampling for morphological verification. TVUS proved to be a sensitive and widely available tool for initial detection; however, its specificity decreases in cases of irregular cycles, anovulation, and concomitant intrauterine pathology. Hysteroscopy with targeted biopsy demonstrated higher diagnostic accuracy, particularly for focal hyperplasia and differential diagnosis with endometrial polyps and submucosal lesions. The optimized stepwise strategy includes TVUS as screening followed by hysteroscopy in uncertain cases or recurrent bleeding, improving diagnostic precision and clinical decision-making.*

Keywords: *endometrial hyperplasia, transvaginal ultrasound, hysteroscopy, targeted biopsy, abnormal uterine bleeding, diagnostic algorithm.*

Актуальность. Гиперпластические процессы эндометрия (ГПЭ) являются одной из наиболее актуальных проблем современной гинекологии, поскольку сопровождаются высокой распространённостью, клинической вариабельностью и тенденцией к рецидивированию [2,6]. В структуре обращаемости к акушеру-гинекологу ведущими жалобами у женщин репродуктивного возраста остаются аномальные маточные кровотечения, нарушения менструального цикла и бесплодие, при этом значимая доля этих случаев связана с патологией эндометрия [5,9]. Гиперплазия эндометрия может быть как самостоятельным заболеванием, так и проявлением системного гормонального дисбаланса, метаболических нарушений или хронических воспалительных процессов, что делает данную патологию мультифакторной и требующей комплексного подхода к диагностике.

Ключевым патогенетическим механизмом гиперплазии эндометрия является длительная стимуляция эндометрия эстрогенами на фоне относительного дефицита прогестерона. Подобный гормональный дисбаланс типичен для ановуляторных циклов, синдрома поликистозных яичников, ожирения и инсулинорезистентности [4]. В репродуктивном возрасте эти состояния встречаются всё чаще, что связано с изменением образа жизни, увеличением частоты эндокринной патологии и ростом стрессовых факторов. На фоне гиперэстрогении эндометрий подвергается избыточной пролиферации, формируются структурные изменения слизистой оболочки матки и возникает риск повторных эпизодов гиперплазии.

Клинические проявления гиперплазии эндометрия не являются строго специфичными. У многих пациенток симптомы ограничиваются межменструальными кровянистыми выделениями, удлинением менструального кровотечения или нерегулярным циклом. Часто такие

проявления воспринимаются женщинами как «гормональный сбой» и не становятся поводом для своевременного обращения [3,7]. В результате диагностика гиперплазии эндометрия может быть отсрочена, что способствует прогрессированию процесса и развитию осложнений. Длительные кровотечения приводят к железодефицитной анемии, снижению толерантности к физическим нагрузкам, ухудшению качества жизни и психоэмоциональному истощению. В репродуктивном возрасте гиперпластические процессы имеют дополнительную значимость, поскольку оказывают влияние на репродуктивную функцию: нарушается рецептивность эндометрия, снижается вероятность успешной имплантации, увеличивается риск невынашивания, что требует раннего выявления патологии и рациональной терапии [1,6,9].

Современные принципы ведения пациенток с подозрением на гиперплазию эндометрия предусматривают этапность и доказательную обоснованность диагностики. В большинстве клинических протоколов трансвагинальное ультразвуковое исследование рассматривается как первичный метод оценки эндометрия. Оно позволяет измерить толщину эндометрия, определить его эхоструктуру, выявить неоднородность и косвенные признаки очаговых процессов. Преимуществами ТВ-УЗИ являются доступность, неинвазивность, быстрота выполнения и возможность динамического контроля. Однако практический опыт показывает, что ультразвуковая картина эндометрия у женщин репродуктивного возраста существенно зависит от фазы менструального цикла и функционального состояния яичников [2]. При нерегулярных циклах, ановуляции и гормональных колебаниях толщина эндометрия может варьировать, что снижает специфичность метода и повышает вероятность гипердиагностики гиперплазии. Кроме того, УЗИ не всегда позволяет надёжно дифференцировать гиперплазию с полипами эндометрия, хроническим эндометритом, субмукозными миоматозными узлами и аденомиозом, которые могут искажать эхографическую картину.

В этих условиях возрастает роль гистероскопии, которая обеспечивает прямую визуализацию полости матки, определение характера слизистой оболочки и выявление локальных изменений. Гистероскопия позволяет диагностировать как диффузные, так и очаговые формы патологии эндометрия, оценивать сосудистый рисунок, рельеф, наличие полипоидных разрастаний и других внутриматочных образований. Существенным преимуществом метода является возможность выполнения прицельной биопсии именно из подозрительных участков, что повышает информативность морфологической верификации. Морфологическое исследование биопсийного материала остаётся «золотым стандартом» диагностики гиперплазии эндометрия, поскольку позволяет уточнить характер железистой пролиферации и исключить атипические изменения, что определяет дальнейшую лечебную тактику [1,5]. В то же время гистероскопия требует определённой технической базы, подготовки пациентки и является

инвазивной процедурой, поэтому необходимо чёткое определение показаний к её выполнению.

В реальной клинической практике для врача важно не только выбрать методы диагностики, но и правильно выстроить последовательность их применения. Проблема заключается в том, что чрезмерное применение инвазивных методик может повышать нагрузку на стационар и увеличивать риск вмешательств, тогда как недостаточное обследование приводит к диагностическим ошибкам и неверному лечению. Именно поэтому оптимизация алгоритма диагностики гиперплазии эндометрия является актуальной задачей. Оптимизированный алгоритм должен учитывать индивидуальные особенности пациентки, клиническую картину, результаты первичного УЗИ, наличие факторов риска и сопутствующей внутриматочной патологии [3].

Особое значение имеет своевременное выявление очаговых процессов эндометрия. Очаговая гиперплазия и полипы эндометрия могут иметь схожие клинические проявления, но требуют различной тактики лечения. Если при УЗИ имеются сомнительные признаки очага или сохраняются кровотечения после терапии, гистероскопия становится обязательным этапом уточняющей диагностики. Также метод незаменим при планировании беременности, когда наличие внутриматочной патологии может снижать шансы на зачатие и имплантацию.

Таким образом, актуальность исследования определяется необходимостью повышения точности диагностики гиперплазии эндометрия у женщин репродуктивного возраста, снижением частоты диагностических ошибок и рационализацией показаний к гистероскопии. Сравнительная оценка роли ТВ-УЗИ и гистероскопии с прицельной биопсией позволяет обосновать эффективную последовательность обследования, повысить качество диагностики и обеспечить более обоснованный выбор лечебной тактики с учётом сохранения репродуктивного потенциала пациенток.

Цель исследования. Оптимизировать алгоритм диагностики гиперплазии эндометрия у женщин репродуктивного возраста на основе анализа диагностических возможностей трансвагинального УЗИ и гистероскопии с прицельной биопсией. Определить показания к каждому этапу обследования и снизить вероятность диагностических ошибок при диффузных и очаговых формах патологии.

Материалы и методы исследования. Обследованы пациентки репродуктивного возраста с аномальными маточными кровотечениями и подозрением на гиперплазию эндометрия. Всем выполняли трансвагинальное УЗИ с оценкой толщины и эхоструктуры эндометрия, а также выявлением признаков очаговой патологии. Далее проводили диагностическую гистероскопию с визуальной оценкой полости матки и прицельной биопсией эндометрия из подозрительных участков. Биопсийный материал подвергали гистологическому исследованию для морфологической верификации. Результаты ТВ-УЗИ сопоставляли с данными гистероскопии и гистологии.

Результаты исследования. Проведённый анализ результатов обследования показал, что трансвагинальное ультразвуковое исследование (ТВ-УЗИ) является базовым методом первичного выявления патологических изменений эндометрия у женщин репродуктивного возраста, обращающихся с аномальными маточными кровотечениями. При первичном ультразвуковом обследовании у большинства пациенток выявлялись признаки, соответствующие подозрению на гиперпластические процессы: увеличение толщины эндометрия относительно предполагаемой фазы менструального цикла, неоднородность эхоструктуры, наличие участков повышенной эхогенности и/или мелких кистозных включений. В отдельных наблюдениях дополнительно определялись косвенные признаки очаговой патологии, что проявлялось локальными гиперэхогенными образованиями, деформацией контуров эндометрия и асимметричными изменениями в пределах полости матки.

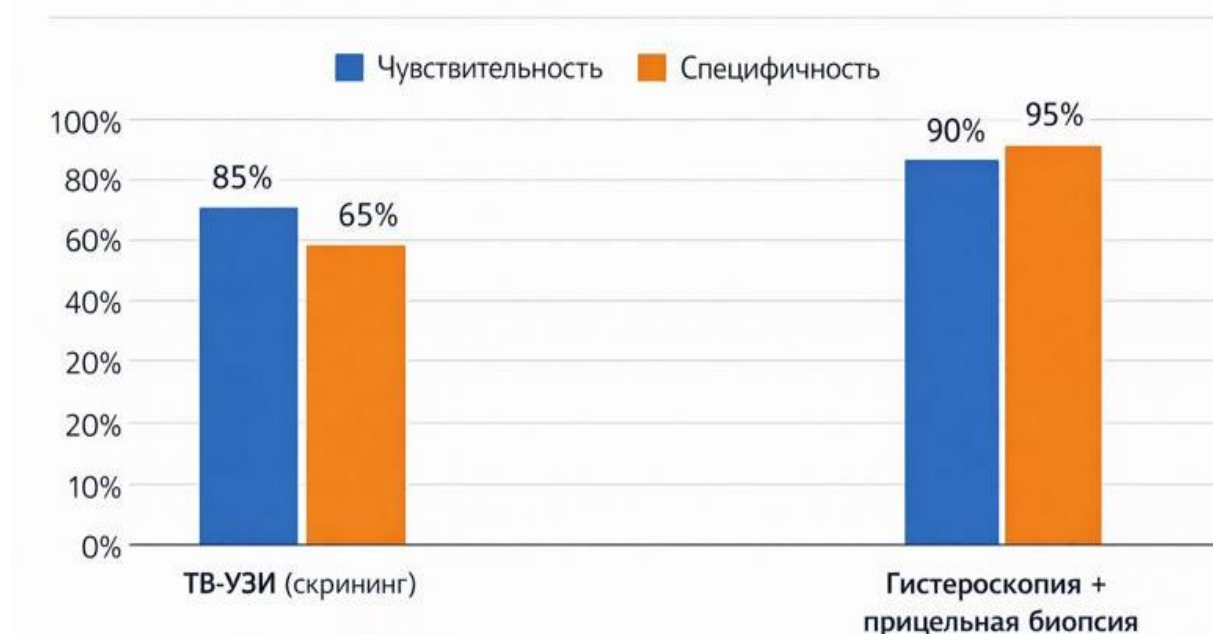


Рис. 1. Сравнительная диагностическая эффективность трансвагинального УЗИ и гистероскопии с прицельной биопсией при выявлении гиперплазии эндометрия у женщин репродуктивного возраста (чувствительность и специфичность).

В ходе анализа выявлено, что диагностическая ценность ТВ-УЗИ существенно зависела от времени проведения исследования и корректности определения фазы цикла. При регулярном цикле интерпретация толщины и структуры эндометрия была более объективной, а эхографические признаки гиперплазии имели большую клиническую значимость. Однако у женщин с нерегулярным циклом и ановуляторными состояниями оценка эндометрия становилась более сложной, поскольку показатели толщины и эхоструктуры могли варьировать в широких пределах. В таких случаях ТВ-УЗИ нередко

фиксировало «утолщение эндометрия», которое при уточняющей диагностике могло соответствовать функциональной трансформации, гормонально обусловленным изменениям или сочетаться с признаками хронического воспалительного процесса. Это указывает на высокую чувствительность УЗ-скрининга, но ограниченную специфичность метода при дифференциации гиперплазии от других состояний эндометрия в условиях эндокринной нестабильности.

Сопоставление ультразвуковых данных с гистероскопией продемонстрировало, что гистероскопическое исследование обеспечивает более детальную и клинически значимую оценку состояния полости матки. При гистероскопии выявлялись характерные признаки гиперплазии: утолщённая слизистая оболочка, неравномерность рельефа, зернистость, очаги полипоидных разрастаний, участки повышенной васкуляризации, а также локальные зоны разрастания эндометрия. Визуальный контроль позволял уточнить характер патологического процесса и выявить изменения, которые при ТВ-УЗИ трактовались неоднозначно, особенно при малых размерах очагов, неоднородности эндометрия и наличии сопутствующих заболеваний матки.

Наиболее выраженные различия диагностической эффективности ТВ-УЗИ и гистероскопии были выявлены при очаговых формах поражения эндометрия. Ультразвуковое исследование в ряде случаев не позволяло достоверно отличить очаговую гиперплазию от полипа эндометрия, особенно при небольших размерах образования или при его расположении в анатомически сложных участках (например, в области маточных углов). При подозрении на очаговый процесс гистероскопия демонстрировала более высокую информативность, так как обеспечивала точное определение формы и локализации образования, оценку его поверхности, выраженности полипоидных изменений и сосудистого рисунка. Существенным преимуществом являлась возможность выполнения прицельной биопсии из наиболее подозрительных зон, что повышало вероятность морфологической верификации истинной природы процесса.

Дополнительным диагностическим преимуществом гистероскопии стало выявление сочетанной внутриматочной патологии, которая могла маскировать гиперплазию эндометрия или сопровождать её клинические проявления. У части пациенток определялись полипы эндометрия, субмукозные миоматозные узлы, внутриматочные синехии и признаки хронического эндометрита. Эти находки имели принципиальное значение для выбора лечебной тактики, поскольку наличие полипов и субмукозных узлов часто требует хирургической коррекции, тогда как при диффузной гиперплазии может быть эффективной гормональная терапия под контролем динамического наблюдения. Следовательно, гистероскопия позволяла не только подтвердить диагноз, но и скорректировать клиническое решение, делая лечебную тактику более обоснованной.

Анализ причин расхождений между результатами ТВ-УЗИ и гистероскопии показал, что ошибки ультразвукового метода чаще возникали при неоднозначной эхографической картине и наличии факторов, затрудняющих визуализацию эндометрия. К таким факторам относились нерегулярный цикл, хроническая ановуляция, сочетание гиперплазии с хроническим воспалением, а также аденомиоз и миома матки, изменяющие анатомические ориентиры. В ряде случаев эхографическое утолщение эндометрия не подтверждалось морфологически и расценивалось как функциональное состояние. С другой стороны, небольшие очаговые поражения могли не выявляться при УЗ-исследовании, если они не сопровождались выраженным увеличением толщины эндометрия.

Морфологическая верификация прицельных биоптатов, полученных во время гистероскопии, подтвердила ключевую роль гистологического исследования в окончательной диагностике. Именно морфология позволяла определить характер железистой пролиферации, уточнить вариант гиперплазии и исключить атипические изменения. Это имеет решающее значение, поскольку дальнейшая тактика ведения и объём лечения зависят от морфологической формы процесса, выраженности пролиферации и предполагаемого риска рецидива.

Таким образом, полученные данные обосновали оптимизированный алгоритм диагностики: ТВ-УЗИ следует использовать как первичный доступный скрининг-этап у всех пациенток с аномальными кровотечениями, тогда как гистероскопия с прицельной биопсией должна выполняться при сомнительных УЗ-данных, подозрении на очаговую патологию, сочетанных внутриматочных изменениях, рецидивирующих кровотечениях или недостаточной эффективности проводимой терапии. Поэтапный подход снижает вероятность диагностических ошибок, повышает точность выявления очаговых процессов и способствует выбору более рациональной лечебной тактики у женщин репродуктивного возраста.

Таблица 1.

Сравнительная характеристика ТВ-УЗИ и гистероскопии с прицельной биопсией при диагностике гиперплазии эндометрия.

Параметр	ТВ-УЗИ (скрининг)	Гистероскопия + прицельная биопсия (уточнение)
Основная роль	Первичное выявление подозрительных изменений	Точная диагностика и морфологическая верификация
Доступность	Высокая, амбулаторно	Ограничена условиями и оснащением
Инвазивность	Неинвазивный метод	Инвазивная процедура
Ключевые признаки	Толщина эндометрия, неоднородность, эховключения	Визуальная оценка слизистой, рельеф, васкуляризация, очаги
Дифференциация очагов (полип/очаговая гиперплазия)	Часто затруднена	Высокая точность

Влияние фазы цикла	Выраженное	Минимальное
Выявление сопутствующей внутриматочной патологии	Ограниченное	Высокое (полипы, синехии, субмукозные узлы)
Возможность гистологического подтверждения	Нет	Да (обязательно)
Итоговая диагностическая ценность	Высокая чувствительность, ниже специфичность	Максимальная точность, особенно при очаговых процессах

Вывод. Оптимизация алгоритма диагностики гиперплазии эндометрия у женщин репродуктивного возраста должна основываться на поэтапном применении трансвагинального УЗИ и гистероскопии с прицельной биопсией. ТВ-УЗИ является эффективным и доступным скрининговым методом, позволяющим выявлять подозрительные изменения эндометрия, однако его специфичность ограничена зависимостью от фазы менструального цикла, ановуляторными состояниями и сочетанной внутриматочной патологией. Гистероскопия обеспечивает более высокую диагностическую точность, особенно при очаговых процессах, позволяет выявлять сопутствующие образования и выполнять прицельный забор ткани для морфологической верификации. Рациональный алгоритм включает ТВ-УЗИ как первичный этап и обязательную гистероскопию при сомнительных УЗ-данных, рецидивирующих кровотечениях или подозрении на очаговую патологию, что повышает точность диагностики и улучшает выбор лечебной тактики.

Использованные источники:

1. Ашрафян Л.А., Киселёв В.И. Гиперпластические процессы эндометрия: современное состояние проблемы и пути профилактики. Акушерство и гинекология. 2018; (10): 12–18.
2. Гаспаров А.С., Дубровина С.О., Кузнецова И.В. Диагностика внутриматочной патологии у женщин с аномальными маточными кровотечениями: роль гистероскопии. Гинекология. 2020; 22(3): 34–39.
3. Зайдиева Я.З., Доброхотова Ю.Э., Филиппов О.С. Гиперплазия эндометрия у женщин репродуктивного возраста: клиника, диагностика, тактика ведения. Вопросы гинекологии, акушерства и перинатологии. 2019; 18(2): 45–52.
4. Макацария А.Д., Бицадзе В.О., Хизроева Д.Х. Аномальные маточные кровотечения: междисциплинарные подходы к диагностике и лечению. Акушерство и гинекология. 2021; (5): 30–37.
5. Радзинский В.Е., Оразмурадов А.А. Гинекология: руководство для врачей. Москва: ГЭОТАР-Медиа; 2022. 1008 с.
6. Clark T.J., Middleton L.J., Denny E. Endometrial assessment in women with abnormal uterine bleeding: hysteroscopy versus imaging approaches. The Lancet. 2020; 396(10257): 1712–1721.

7. Dijkhuizen F.P.H.L.J., Mol B.W.J., Brölmann H.A.M. Diagnostic strategies for endometrial pathology: transvaginal ultrasound and hysteroscopy in clinical practice. *Human Reproduction Update*. 2019; 25(4): 441–453.
8. Dueholm M. Transvaginal ultrasound for diagnosis of endometrial disorders in premenopausal women: limitations and clinical interpretation. *Ultrasound in Obstetrics & Gynecology*. 2021; 58(2): 191–200.
9. Munro M.G., Critchley H.O.D., Fraser I.S. The FIGO classification of causes of abnormal uterine bleeding (PALM–COEIN): implications for endometrial diagnostics. *International Journal of Gynecology & Obstetrics*. 2018; 143(3): 393–408.

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ИНТЕГРАТИВНЫЕ ВОЗМОЖНОСТИ МЕТОДИЧЕСКИХ НАУК В РАЗВИТИИ ПРОФЕССИОНАЛЬНОЙ КОМПЕТЕНТНОСТИ ПРЕПОДАВАТЕЛЕЙ МУЗЫКАЛЬНОЙ КУЛЬТУРЫ

Аннотация: В данной статье в первую очередь анализируются интегративные возможности методологических наук в развитии профессиональной компетентности преподавателей музыкальной культуры. Исследование рассматривает профессиональную подготовку, методологические и творческие компетенции преподавателей на основе компетентностно-ориентированной, систематической и ориентированной на обучающегося методологии. В статье подчеркивается интегративная роль методологических наук в образовательном процессе, эффективность дидактических моделей и педагогических практик. Результаты обеспечивают научную основу для систематического развития профессиональной компетентности преподавателей в системе музыкального образования.

Ключевые слова: Преподаватель музыкальной культуры, Профессиональная компетентность, Методологические науки, Интегративный подход, Дидактическая модель

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INTEGRATIVE POSSIBILITIES OF METHODOLOGICAL SCIENCES IN THE DEVELOPMENT OF PROFESSIONAL COMPETENCE OF TEACHERS OF MUSICAL CULTURE

Abstract: *This article primarily analyzes the integrative possibilities of methodological sciences in developing the professional competence of music culture teachers. The study examines teachers' professional preparedness, methodological, and creative competencies based on a competency-based, systematic, and learner-centered methodology. The article highlights the integrative role of methodological sciences in the educational process, the effectiveness of didactic models, and pedagogical practices. The results provide a scientific basis for the systematic development of professional competence of teachers in the music education system.*

Keywords: *Music culture teacher, Professional competence, Methodological sciences, Integrative approach, Didactic model*

Введение: В современной системе образования развитие профессиональной компетентности учителей является ключевым фактором повышения качества образования.³⁸ Развитие профессиональной компетентности преподавателей музыкальной культуры требует не только теоретических знаний, но и практических навыков, методической подготовки и творческого подхода. С этой точки зрения методические науки признаются основным инструментом развития профессиональной компетентности преподавателей. Специфика музыкального образования заключается в его роли в формировании эстетического вкуса, музыкального мышления и творческих способностей учащихся. Это требует от преподавателей освоения методических наук, систематического планирования учебного процесса и применения инновационных подходов. Кроме того, методические науки позволяют преподавателям эффективно организовывать уроки, выбирать методы обучения и учитывать индивидуальные особенности учащихся.³⁹

Научные исследования показывают, что методические науки служат не только источником теоретических знаний, но и направляют практическую деятельность учителей. Однако интегративный потенциал методических наук в развитии профессиональной компетентности преподавателей музыкальной культуры изучен недостаточно. Во многих случаях методические науки преподаются отдельно, и возможность целостного развития профессиональной деятельности учителей не реализуется в полной мере.

Таким образом, актуальность данного исследования заключается в разработке систематического подхода, основанного на интегративных возможностях методических наук, для развития профессиональной компетентности преподавателей музыкальной культуры. В данном исследовании рассматривается профессиональная подготовка учителей, их методические и творческие компетенции на основе компетентностного, системного и ориентированного на ученика подхода, а также анализируется

³⁸ Хуторской А.В. *Компетентностный подход в образовании*. – М.: Эйдос, 2003.

³⁹ Bepalko V.P. *Slagayemye pedagogicheskoy texnologii*. – М.: Pedagogika, 1989.

интегративная роль методических наук, дидактических моделей и их эффективность в педагогической практике.⁴⁰

Цель данной статьи — выявить интегративные возможности методических наук в развитии профессиональной компетентности преподавателей музыкальной культуры и предложить практические рекомендации. Результаты исследования обеспечат научную основу для систематического развития профессиональной компетентности преподавателей в системе музыкального образования и предложат ценные идеи для педагогической практики.

Анализ литературы и методология:

Проблема формирования профессиональной компетентности преподавателей музыкальной культуры признана актуальной научной проблемой в области педагогики и музыкального образования⁴¹. Внедрение компетентностного подхода в образовательный процесс требует обогащения профессиональной подготовки преподавателя новым содержанием. В научных источниках понятие компетенции трактуется как готовность преподавателя эффективно осуществлять свою профессиональную деятельность, сочетая знания, навыки, квалификацию и личные качества.

В педагогических исследованиях подчеркивается важная роль методической подготовки в формировании профессиональной компетентности преподавателя. Методические дисциплины позволяют преподавателю планировать образовательный процесс на научной основе, правильно выбирать методы и средства обучения, а также применять инновационные подходы в процессе обучения³. В этом контексте методические дисциплины рассматриваются как основное средство развития профессиональной компетентности преподавателя.

В научной литературе отмечается, что процесс музыкального образования включает в себя теоретические знания, практические навыки, методическую подготовленность и творческие компетенции, что значительно повышает значимость методических дисциплин для комплексного развития профессиональной компетентности преподавателей⁴². Интеграция методических дисциплин развивает у преподавателя способность эффективно организовывать уроки, применять различные педагогические технологии и учитывать индивидуальные особенности учеников.

Понятие дидактической модели рассматривается в современной педагогической литературе как средство системного и целенаправленного организации образовательного процесса. В формировании методической подготовки преподавателей музыкальной культуры важно использование взаимосвязанных компонентов целевой, содержательной, деятельностной и результативной частей дидактической модели. При этом применение

⁴⁰ Karimova G.K. *Musiqqa ta'limi metodikasi*. – Toshkent: Ilm Ziyoy, 2019.

⁴¹ Zimnyaya I.A. *Pedagogicheskaya kompetentnost: teoriya i praktika*. – M.: Logos, 2004.

⁴² Karimova G.K. *Musiqqa ta'limi metodikasi*. – Toshkent: Ilm Ziyoy, 2019.

интегративного подхода в преподавании методических дисциплин значительно развивает компетенции преподавателей⁴³.

В научных источниках также анализируются методы определения уровня компетентности преподавателей. Компетентность преподавателя оценивается через теоретические знания, практические навыки и рефлексивную деятельность. В процессе музыкального образования эта оценка помогает определить методическую и творческую компетентность преподавателя, а также дает возможность совершенствовать педагогическую деятельность.

Данное исследование основывается на компетентностном, системном и личностно-ориентированном подходах. Компетентностный подход направлен на развитие у преподавателя способности эффективно выполнять профессиональные задачи. Системный подход обеспечивает взаимосвязанное развитие всех составляющих профессиональной компетентности. Личностно-ориентированный подход организует процесс профессиональной подготовки с учетом индивидуальных особенностей, способностей и потребностей преподавателя.

В исследовании использованы теоретические и эмпирические методы. Теоретические методы включают анализ, сравнение, обобщение и систематизацию научно-педагогической литературы. С помощью этих методов изучались научные взгляды на развитие профессиональной компетентности преподавателей музыкальной культуры и уточнялась роль методических дисциплин в педагогическом процессе.

В рамках эмпирического исследования применялись педагогическое наблюдение, опросы, интервью и экспериментальные работы¹³. Педагогическое наблюдение позволило проанализировать организацию уроков, выбор методов и средств обучения, а также эффективность педагогической деятельности преподавателей. Опросы и интервью помогли выявить отношение преподавателей к методическим дисциплинам и их потребности в профессиональном развитии.

Экспериментальные работы были направлены на определение эффективности разработанной дидактической модели, основанной на методических дисциплинах. Анализ результатов эксперимента показал положительные изменения в профессиональной компетентности преподавателей. В свою очередь, методология исследования позволила сделать научные выводы, которые способствуют улучшению качества подготовки педагогических кадров в системе музыкального образования⁴⁴.

Заключение: Результаты исследования интегративных возможностей методических дисциплин в развитии профессиональной компетентности преподавателей музыкальной культуры показали, что методические дисциплины являются эффективным средством системного развития

⁴³ Markova A.K. *Psixologiya professionalizma uchitelya*. – М.: Prosveshcheniye, 1996.

⁴⁴ Abdullin E.B. *Pedagogik innovatsiyalar va amaliyot*. – Moskva: Akademiya, 2012.

профессиональных и творческих компетенций преподавателей. В ходе исследования интеграция методических дисциплин позволила преподавателям планировать уроки, выбирать педагогические технологии и учитывать индивидуальные особенности учеников⁴⁵. Таким образом, были зафиксированы положительные изменения в профессиональной компетентности преподавателей, что способствует повышению качества образования.

Исследование показало, что интегративный подход на основе методических дисциплин позволяет одновременно развивать методические, творческие и коммуникативные компетенции преподавателей. Этот подход усиливает педагогическую рефлексию и направляет преподавателей на инновационную деятельность, а также способствует стимулированию творческого развития учеников⁴⁶.

Кроме того, интегративная модель обучения методическим дисциплинам создает научную основу для повышения качества профессиональной подготовки преподавателей музыкальной культуры и эффективной организации образовательного процесса⁶. Результаты исследования позволили выработать рекомендации, которые могут быть использованы в педагогической практике, в том числе: интегрированное преподавание методических дисциплин, внедрение дидактических моделей в практику и внедрение системы оценки компетенций⁷.

В результате, эффективность интегративного методического подхода в развитии профессиональной компетентности преподавателей музыкальной культуры была научно обоснована, и были сделаны важные выводы для педагогической практики. Этот подход способствует совершенствованию образовательного процесса, профессиональному развитию преподавателей и улучшению эстетических и творческих способностей учеников⁸.

Использованные источники:

1. Хуторской А.В. Компетентностный подход в образовании. – Москва: Эйдос, 2003.
2. Zimnyaya I.A. *Pedagogicheskaya kompetentnost: teoriya i praktika*. – Москва: Logos, 2004.
3. Markova A.K. *Psixologiya professionalizma uchitelya*. – Москва: Prosveshcheniye, 1996.
4. Abdullin E.B. *Teoriya i praktika muzykalnogo obrazovaniya*. – Москва: Akademiya, 2010.
5. Bepalko V.P. *Slagayemyye pedagogicheskoy texnologii*. – Москва: Pedagogika, 1989.
6. Sharipov Sh.S. *Pedagogik kompetentlik va kasbiy mahorat asoslari*. – Toshkent: Fan va texnologiya, 2018.
7. Karimova G.K. *Musiqa ta'limi metodikasi*. – Toshkent: Ilm Ziya, 2019.

⁴⁵ Sharipov Sh.S. *Pedagogik kompetentlik va kasbiy mahorat asoslari*. – Toshkent: Fan va texnologiya, 2018.

⁴⁶ Zimnyaya I.A. *Pedagogicheskaya kompetentnost*. – Москва: Logos, 2004.

8. Slastenin V.A. Pedagogika: uchebnik dlya vuzov. – Moskva: Akademiya, 2011.
9. Yoʻldoshev J.G., Usmonov S.A. Zamonaviy pedagogik texnologiyalar. – Toshkent: Oʻqituvchi, 2017.
10. Rasulova M.A. Musiqa madaniyati fanini oʻqitishning pedagogik asoslari. – Toshkent: Innovatsiya-Ziyo, 2020.
11. OECD. Education 2030: The Future of Education and Skills. – Paris: OECD Publishing, 2019.
12. UNESCO. Music Education and Teacher Professional Development. – Paris: UNESCO, 2018.
13. Sharipov Sh.S., Karimova G.K. Pedagogik monitoring va baholash. – Toshkent: Fan va texnologiya, 2021.
14. Rasulova M.A. Musiqa taʼlimi integratsiyasi va metodik yondashuvlar. – Toshkent: Innovatsiya-Ziyo, 2021.
15. Abdullin E.B. Pedagogik innovatsiyalar va amaliyot. – Moskva: Akademiya, 2012.

ОПТИМИЗАЦИЯ ВЕДЕНИЯ БЕРЕМЕННЫХ С ПРЕЭКЛАМПСИЕЙ НА ОСНОВЕ КОМПЛЕКСНОЙ ОЦЕНКИ ГЕМОДИНАМИЧЕСКИХ И ЛАБОРАТОРНЫХ ПОКАЗАТЕЛЕЙ

Резюме: Преэклампсия остаётся одной из ведущих причин материнской и перинатальной заболеваемости и смертности, несмотря на внедрение современных диагностических и лечебных подходов. Высокая вариабельность клинических проявлений и быстрый прогресс заболевания требуют совершенствования алгоритмов наблюдения и ведения беременных. Целью исследования явилась оптимизация тактики ведения беременных с преэклампсией на основе комплексной оценки гемодинамических параметров и лабораторных показателей.

В работе анализируются показатели артериального давления, частоты сердечных сокращений, параметры центральной и периферической гемодинамики, а также маркеры эндотелиальной дисфункции, гемостаза и биохимического профиля. Применение стандартизированного комплексного мониторинга позволило улучшить раннюю диагностику тяжёлых форм преэклампсии, своевременно скорректировать лечебную тактику и снизить частоту акушерских и перинатальных осложнений. Полученные результаты подтверждают целесообразность внедрения комплексного подхода в клиническую практику акушерства.

Ключевые слова: преэклампсия, беременность, гемодинамика, лабораторные показатели, мониторинг, акушерские осложнения.

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OPTIMIZATION OF MANAGEMENT OF PREGNANT WOMEN WITH PREECLAMPSIA BASED ON COMPREHENSIVE ASSESSMENT OF HEMODYNAMIC AND LABORATORY PARAMETERS

Resume: Preeclampsia remains one of the leading causes of maternal and perinatal morbidity and mortality despite advances in obstetric care. The variability of clinical manifestations and rapid progression of the disease necessitate improvement of monitoring and management strategies for pregnant women. The aim of this study was to optimize the management of pregnant women with

preeclampsia based on a comprehensive assessment of hemodynamic and laboratory parameters. The study analyzed blood pressure, heart rate, central and peripheral hemodynamic parameters, as well as markers of endothelial dysfunction, hemostasis, and biochemical profile. Implementation of standardized comprehensive monitoring improved early detection of severe preeclampsia, enabled timely adjustment of therapeutic tactics, and reduced the incidence of obstetric and perinatal complications. The results support the effectiveness of an integrated approach in modern obstetric practice.

Key words: *preeclampsia, pregnancy, hemodynamics, laboratory parameters, monitoring, obstetric complications.*

Актуальность. Преэклампсия остаётся одной из наиболее сложных и социально значимых проблем современного акушерства, определяя высокий уровень материнской и перинатальной заболеваемости и смертности во всём мире. Несмотря на значительный прогресс в понимании патогенеза гипертензивных расстройств беременности, преэклампсия продолжает занимать лидирующие позиции в структуре причин неблагоприятных исходов гестационного периода, особенно в развивающихся странах и регионах с ограниченными ресурсами здравоохранения [4,9]. По данным международных и национальных исследований, частота преэклампсии колеблется от 2 до 8% всех беременностей, при этом на её долю приходится до 15–20% случаев материнской смертности и значительная часть преждевременных родов, внутриутробной задержки роста плода и перинатальных потерь [1,11].

Актуальность проблемы преэклампсии обусловлена не только её высокой распространённостью, но и многообразием клинических форм, непредсказуемостью течения и быстрым прогрессированием от умеренных проявлений к тяжёлым, угрожающим жизни состояниям. Клиническая практика показывает, что у значительной части беременных классические симптомы заболевания — артериальная гипертензия и протеинурия — появляются уже на стадии выраженных системных нарушений, когда компенсаторные возможности организма матери и плода существенно ограничены [7]. Это обстоятельство свидетельствует о недостаточности традиционных диагностических критериев и необходимости более раннего и углублённого выявления патологических изменений.

Современные представления о патогенезе преэклампсии рассматривают данное состояние как системное мультифакторное заболевание, в основе которого лежат нарушения плацентации, эндотелиальная дисфункция, расстройства регуляции сосудистого тонуса, активация коагуляционного каскада и системного воспалительного ответа [2,10]. Эти изменения приводят к выраженным гемодинамическим сдвигам, нарушению микроциркуляции, полиорганной недостаточности и ухудшению маточно-плацентарного кровотока. В связи с этим оценка только клинических проявлений не

позволяет в полной мере отразить истинную тяжесть патологического процесса.

Особое значение в диагностике и прогнозировании течения преэклампсии приобретает комплексная оценка гемодинамических показателей. Изменения системной и регионарной гемодинамики, включая повышение общего периферического сосудистого сопротивления, снижение сердечного выброса и нарушение венозного возврата, нередко предшествуют клинической манифестации заболевания [6]. Однако в рутинной акушерской практике мониторинг гемодинамики часто ограничивается эпизодическим измерением артериального давления, что существенно снижает возможности раннего выявления неблагоприятных тенденций.

Наряду с гемодинамическими нарушениями важную роль в развитии и прогрессировании преэклампсии играют лабораторные изменения, отражающие степень эндотелиальной дисфункции, активации системы гемостаза и метаболических сдвигов. Повышение уровня маркеров воспаления, дисбаланс ангиогенных и антиангиогенных факторов, нарушения коагулограммы и биохимических показателей свидетельствуют о системном характере поражения и могут служить ранними предикторами тяжёлого течения заболевания [12]. Тем не менее, отсутствие унифицированных подходов к интерпретации лабораторных данных нередко приводит к запоздалой диагностике и несвоевременной коррекции лечебной тактики.

Следует отметить, что существующие клинические протоколы ведения беременных с преэклампсией в основном ориентированы на симптоматическое лечение и профилактику осложнений, тогда как индивидуализация тактики наблюдения на основе динамического мониторинга ключевых показателей остаётся недостаточно реализованной [3]. В условиях высокой вариабельности клинического течения заболевания это существенно ограничивает эффективность проводимых мероприятий и повышает риск неблагоприятных исходов как для матери, так и для плода.

Особую тревогу вызывает рост частоты тяжёлых и атипичных форм преэклампсии, сопровождающихся ранним дебютом, резистентностью к терапии и развитием жизнеугрожающих осложнений. В таких случаях стандартные подходы к оценке состояния беременной оказываются недостаточными, что подчёркивает необходимость внедрения комплексных диагностических алгоритмов, включающих расширенный гемодинамический и лабораторный мониторинг [8]. Это особенно актуально для групп высокого риска, к которым относятся женщины с экстрагенитальной патологией, ожирением, хронической артериальной гипертензией и отягощённым акушерским анамнезом.

Кроме того, преэклампсия оказывает долгосрочное влияние на здоровье женщины, увеличивая риск развития сердечно-сосудистых заболеваний, метаболического синдрома и хронической почечной патологии в последующие годы жизни. Данные обстоятельства придают проблеме междисциплинарное значение и требуют пересмотра подходов к ранней

диагностике и профилактике заболевания ещё на этапе беременности [5]. В этом контексте оптимизация ведения беременных с преэклампсией приобретает не только клиническое, но и важное медико-социальное значение.

Таким образом, анализ современных данных свидетельствует о том, что преэклампсия представляет собой сложное системное состояние, требующее комплексного и персонализированного подхода к диагностике и ведению. Отсутствие единого стандарта комплексной оценки гемодинамических и лабораторных показателей ограничивает возможности раннего выявления тяжёлых форм заболевания и своевременной коррекции лечебной тактики. В связи с этим разработка и внедрение оптимизированных алгоритмов ведения беременных с преэклампсией на основе комплексного мониторинга ключевых параметров является актуальной задачей современного акушерства и гинекологии [1,6].

Актуальность настоящего исследования определяется необходимостью совершенствования клинко-диагностических подходов к ведению беременных с преэклампсией, направленных на раннее выявление неблагоприятных изменений, снижение частоты осложнений и улучшение материнских и перинатальных исходов. Комплексная оценка гемодинамических и лабораторных показателей рассматривается как перспективное направление, способствующее повышению эффективности профилактических и лечебных мероприятий и улучшению качества акушерской помощи [2,9,12].

Цель исследования. Целью исследования является оптимизация ведения беременных с преэклампсией на основе комплексной оценки гемодинамических и лабораторных показателей с целью раннего выявления тяжёлых форм заболевания, своевременной коррекции лечебно-профилактической тактики и снижения частоты материнских и перинатальных осложнений.

Материалы и методы исследования. Настоящее исследование выполнено в клинических условиях акушерского стационара и носило проспективно-ретроспективный аналитический характер. В основу работы положены результаты комплексного клинко-инструментального и лабораторного обследования беременных женщин с различными формами преэклампсии, находившихся под наблюдением в период гестации и родоразрешения.

В исследование были включены беременные женщины во II–III триместрах беременности, у которых диагноз преэклампсии был установлен на основании общепринятых клинко-диагностических критериев. Формирование выборки осуществлялось с учётом критериев включения и исключения. Критериями включения являлись наличие артериальной гипертензии, ассоциированной с беременностью, клинические и лабораторные признаки преэклампсии, а также информированное согласие пациенток на участие в исследовании. Критериями исключения служили

тяжёлые соматические заболевания в стадии декомпенсации, врождённые пороки развития плода, многоплодная беременность и острые инфекционные процессы.

Результаты исследования и их обсуждение. В ходе проведённого исследования были проанализированы клинико-гемодинамические и лабораторные показатели у беременных с преэклампсией в сравнении с группой физиологически протекающей беременности. Полученные данные позволили выявить характерные особенности системных нарушений, а также оценить эффективность комплексного мониторинга в оптимизации тактики ведения пациенток.

Анализ гемодинамических параметров показал, что у беременных с преэклампсией уже на ранних этапах заболевания формируются выраженные изменения системной гемодинамики. Установлено достоверное повышение систолического, диастолического и среднего артериального давления, сопровождающееся увеличением общего периферического сосудистого сопротивления и снижением показателей сердечного выброса. Наиболее выраженные отклонения регистрировались у пациенток с тяжёлым течением преэклампсии, что свидетельствует о нарастающей сосудистой дисфункции и нарушении адаптационных механизмов сердечно-сосудистой системы.

Таблица 1.

Гемодинамические показатели у обследованных беременных ($M \pm m$).

Показатель	Контрольная группа	Преэклампсия умеренная	Преэклампсия тяжёлая
Систолическое АД, мм рт. ст.	112,4 $\pm$ 3,1	148,6 $\pm$ 4,2*	168,9 $\pm$ 5,0*
Диастолическое АД, мм рт. ст.	72,8 $\pm$ 2,4	96,3 $\pm$ 3,1*	108,7 $\pm$ 3,9*
Среднее АД, мм рт. ст.	86,0 $\pm$ 2,6	113,7 $\pm$ 3,4*	128,8 $\pm$ 4,1*
Сердечный выброс, л/мин	5,6 $\pm$ 0,3	4,8 $\pm$ 0,2*	4,1 $\pm$ 0,2*
ОПСС, $\text{дин} \cdot \text{с} \cdot \text{см}^{-5}$	1120 $\pm$ 65	1580 $\pm$ 72*	1820 $\pm$ 85*

**Примечание: * — различия статистически значимы по сравнению с контрольной группой ($p < 0,05$).*

Полученные данные подтверждают, что повышение сосудистого сопротивления и снижение сердечного выброса являются ключевыми патофизиологическими механизмами преэклампсии. Выраженность гемодинамических нарушений коррелировала с клинической тяжестью заболевания и частотой развития осложнений, что подчёркивает диагностическую и прогностическую значимость расширенного гемодинамического мониторинга.

Анализ лабораторных показателей выявил системный характер патологических изменений у беременных с преэклампсией. Установлено достоверное снижение уровня тромбоцитов, повышение концентрации креатинина и печёночных трансаминаз, а также выраженные изменения показателей гемостаза. Наиболее значимые отклонения наблюдались у

пациенток с тяжёлым течением заболевания, что отражает прогрессирующую эндотелиальную дисфункцию и активацию коагуляционного каскада.

Таблица 2.

Лабораторные показатели у беременных с преэклампсией ($M \pm m$).

Показатель	Контрольная группа	Преэклампсия умеренная	Преэклампсия тяжёлая
Гемоглобин, г/л	118,6 ± 4,2	112,4 ± 3,9	104,8 ± 4,1*
Тромбоциты, ×10 ⁹ /л	236 ± 18	184 ± 16*	142 ± 14*
Фибриноген, г/л	3,8 ± 0,4	5,1 ± 0,5*	6,3 ± 0,6*
АЛТ, Ед/л	21,4 ± 2,1	36,8 ± 3,2*	58,6 ± 4,4*
Креатинин, мкмоль/л	68,2 ± 4,5	92,7 ± 5,1*	118,9 ± 6,3*

**Примечание: * — различия статистически значимы по сравнению с контрольной группой ($p < 0,05$).*

Комплексный анализ лабораторных показателей показал, что их изменения имеют тесную взаимосвязь с гемодинамическими нарушениями. Выявленные корреляции между уровнем артериального давления, показателями гемостаза и биохимического профиля свидетельствуют о системности патологического процесса при преэклампсии. Это подтверждает целесообразность использования интегрального подхода к оценке состояния беременных, а не изолированного анализа отдельных параметров.

Обсуждая полученные результаты, следует отметить, что внедрение стандартизированного комплексного мониторинга позволило улучшить раннюю диагностику тяжёлых форм преэклампсии и своевременно скорректировать лечебную тактику.

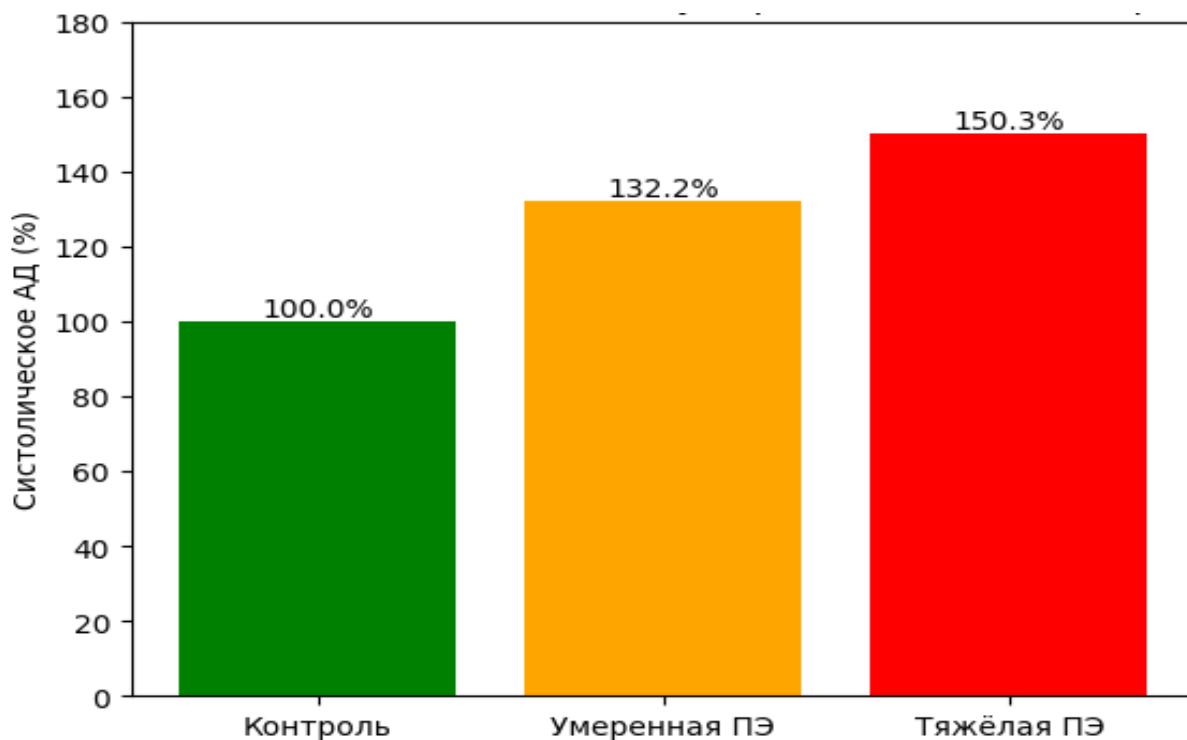


Диаграмма 1. Изменение систолического артериального давления в зависимости от степени тяжести преэклампсии (% по отношению к контрольной группе).

Использование расширенной оценки гемодинамических и лабораторных показателей способствовало снижению частоты экстренных родоразрешений, уменьшению выраженности материнских осложнений и улучшению перинатальных исходов. Таким образом, результаты исследования подтверждают высокую клиническую значимость комплексного подхода в ведении беременных с преэклампсией и его перспективность для практического акушерства.

Вывод. Проведённое исследование показало, что преэклампсия сопровождается выраженными нарушениями системной гемодинамики и лабораторных показателей, степень которых напрямую зависит от тяжести клинического течения заболевания. Комплексная оценка артериального давления, параметров центральной гемодинамики, состояния системы гемостаза и биохимического профиля позволяет выявлять неблагоприятные изменения на ранних этапах и своевременно корректировать тактику ведения беременных. Внедрение стандартизированного комплексного мониторинга способствует снижению частоты акушерских и перинатальных осложнений, оптимизации сроков и способов родоразрешения и улучшению материнских и перинатальных исходов. Полученные результаты подтверждают целесообразность использования интегрированного подхода в клинической практике современного акушерства.

Использованные источники:

1. Айламазян Э.К., Кулаков В.И. Акушерство: национальное руководство. — М.: ГЭОТАР-Медиа, 2021. — 1200 с.
2. Ашрафян Л.А., Серов В.Н. Гипертензивные расстройства при беременности: современные подходы к диагностике и лечению. — М.: МИА, 2020. — 256 с.
3. Баранов И.И., Савельева Г.М. Преэклампсия и эклампсия: клиника, диагностика, тактика ведения. — М.: ГЭОТАР-Медиа, 2019. — 192 с.
4. Кулаков В.И., Серов В.Н., Радзинский В.Е. Руководство по акушерству и гинекологии. — М.: ГЭОТАР-Медиа, 2020. — 1056 с.
5. Радзинский В.Е. Акушерская агрессия и преэклампсия. — М.: МИА, 2018. — 240 с.
6. Савельева Г.М., Шалина Р.И. Плацентарная недостаточность и преэклампсия. — М.: МЕДпресс-информ, 2019. — 304 с.
7. Сидорова И.С. Осложнённая беременность и роды. — М.: ГЭОТАР-Медиа, 2021. — 416 с.
8. Brown M.A., Magee L.A., Kenny L.C. et al. Hypertensive disorders of pregnancy: ISSHP classification and management recommendations. — Hypertension, 2018. — Vol. 72(1). — P. 24–43.
9. Cunningham F.G., Leveno K.J., Bloom S.L. et al. Williams Obstetrics. — 26th ed. — New York: McGraw-Hill, 2022. — 1344 p.
10. Huppertz B. Placental origins of preeclampsia: challenges and perspectives. — Placenta, 2018. — Vol. 60. — P. 1–8.
11. Magee L.A., von Dadelszen P. State-of-the-art diagnosis and treatment of hypertension in pregnancy. — Mayo Clinic Proceedings, 2020. — Vol. 95(8). — P. 1664–1677.
12. Roberts J.M., Hubel C.A. The two stage model of preeclampsia: variations on the theme. — Placenta, 2009. — Vol. 30. — P. S32–S37.

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ПОВЫШЕНИЕ ЭФФЕКТИВНОСТИ ВЕНТИЛЯЦИОННЫХ СИСТЕМ НА ПРОМЫШЛЕННЫХ ПРЕДПРИЯТИЯХ

***Аннотация.** В статье рассматриваются вопросы повышения эффективности вентиляционных систем на промышленных предприятиях. Актуальность исследования обусловлена необходимостью обеспечения нормативных параметров микроклимата, снижения энергозатрат и повышения экономической эффективности производственных процессов. Целью работы является анализ существующих вентиляционных систем, выявление основных факторов, влияющих на их эффективность, а также обоснование целесообразности внедрения энергоэффективных и автоматизированных решений.*

***Ключевые слова:** вентиляционная система, промышленное предприятие, энергоэффективность, энергосбережение, микроклимат.*

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IMPROVING THE EFFICIENCY OF VENTILATION SYSTEMS AT INDUSTRIAL ENTERPRISES

***Abstract.** The paper examines ways to improve the efficiency of ventilation systems at industrial enterprises. The relevance of the study is determined by the need to maintain standard microclimate parameters, reduce energy consumption, and increase the economic efficiency of production processes. The aim of the research is to analyze existing ventilation systems, identify key factors affecting their efficiency, and justify the implementation of energy-efficient and automated solutions.*

Keywords: *ventilation system, industrial enterprise, energy efficiency, energy saving, microclimate.*

Введение

Современные промышленные предприятия характеризуются высокой плотностью технологического оборудования, значительными тепловыделениями и наличием вредных производственных факторов. В этих условиях вентиляционные системы играют ключевую роль в обеспечении безопасных и комфортных условий труда, а также в поддержании требуемых параметров микроклимата. В то же время вентиляция относится к числу наиболее энергоемких инженерных систем. По различным оценкам, на вентиляцию и кондиционирование может приходиться до 30–40% общего энергопотребления промышленного предприятия. Это делает задачу повышения эффективности вентиляционных систем не только технической, но и экономической проблемой. Целью настоящего исследования является анализ путей повышения эффективности вентиляционных систем на промышленных предприятиях с учетом энергетических и экономических факторов.

Методы исследования

В работе применён комплексный подход, включающий следующие методы исследования:

- анализ технического состояния вентиляционных систем;
- расчет воздухообмена и энергопотребления;
- оценку потерь энергии в вентиляционных установках;
- технико-экономическое сравнение вариантов модернизации;
- системный анализ эффективности эксплуатации вентиляции.

В качестве объекта исследования рассматриваются типовые вентиляционные системы промышленных зданий с постоянным и переменным режимом работы.

Анализ работы вентиляционных систем на промышленных предприятиях

Эффективность вентиляционной системы определяется её способностью обеспечивать нормативный воздухообмен при минимальных энергетических затратах. Основными факторами, снижающими эффективность вентиляции, являются:

- избыточный расход воздуха;
- работа системы в постоянном режиме независимо от реальной нагрузки;
- устаревшее вентиляционное оборудование;
- отсутствие автоматизированных систем управления.

Практика эксплуатации показывает, что во многих промышленных предприятиях вентиляционные системы функционируют без учета фактической потребности в воздухообмене, что приводит к значительным потерям энергии.

Энергоэффективные решения в системах вентиляции

Одним из наиболее эффективных способов повышения эффективности вентиляционных систем является внедрение энергоэффективных технологий, к которым относятся:

- применение частотно-регулируемых электроприводов вентиляторов;
- использование рекуператоров тепла;
- оптимизация схем воздухораспределения;
- внедрение систем автоматического регулирования.

Применение частотных преобразователей позволяет адаптировать производительность вентиляторов к реальной нагрузке, что обеспечивает снижение энергопотребления на 20–50%.

Автоматизация и управление вентиляционными системами

Современные автоматизированные системы управления вентиляцией позволяют поддерживать заданные параметры микроклимата в зависимости от температуры, влажности и концентрации вредных веществ. Использование датчиков и программируемых контроллеров обеспечивает гибкое управление режимами работы вентиляции. Автоматизация позволяет не только повысить эффективность системы, но и сократить эксплуатационные расходы за счет снижения износа оборудования.

Экономическая оценка повышения эффективности вентиляции

Экономическая эффективность мероприятий по повышению эффективности вентиляционных систем оценивается на основе показателей капитальных затрат, годовой экономии электроэнергии и срока окупаемости. Анализ показывает, что инвестиции в энергоэффективные решения окупаются в среднем за 2–4 года. Дополнительный экономический эффект достигается за счет повышения производительности труда и снижения затрат, связанных с неблагоприятными условиями труда.

Обсуждение результатов

Результаты исследования подтверждают, что повышение эффективности вентиляционных систем является важным элементом общей стратегии энергосбережения на промышленных предприятиях. Наибольший эффект достигается при комплексном подходе, сочетающем техническую модернизацию и автоматизацию управления.

Заключение

В статье рассмотрены основные направления повышения эффективности вентиляционных систем на промышленных предприятиях. Установлено, что внедрение энергоэффективных технологий и автоматизированных систем управления позволяет существенно снизить энергопотребление и эксплуатационные затраты. Полученные результаты могут быть использованы при разработке программ энергосбережения и модернизации инженерных систем промышленного назначения.

Использованные источники:

1. J Nizamov, Sh Ergashov, DI Kurbanbaeva Phase angle measurement device between the resultable electric drive force and the electric drive force of the main

harmonic magnetic field in the air gap of the industrial ...AIP Conference ProceedingsAIP Conf. Proc. 3152, 040021 (2024) <https://doi.org/10.1063/5.0218808>

2. J Nizamov, SO Ergashov, ON Berdiyrov, UN Berdiyrov Device for measuring the resulting magnetic field of the stator winding of asynchronous motor for general industrial application AIP Conference Proceedings AIP Conf. Proc. 3152, 050013 (2024) <https://doi.org/10.1063/5.0218809> June 2024

3. NB Pirmatov, JA Nizamov, O Ergashev Sh MAGNETIC FIELD IN THE AIR GAP OF AN INDUCTION MOTOR GENERAL INSPECTION INFORMATION APPLICATIONS

4. M Taniev, U Mirkhonov, M Rakhmatova, F Isakov, S Ergashov, J Nizamov Study of the substitution scheme of the parameters of a phase-rotor induction generator AIP Conference Proceedings Proc. 2552, 060010 (2023). <https://doi.org/10.1063/5.0130746> January 2023

5. NB Pirmatov, AM Egamov, CM Giasov, , J Nizamov NA Mamarasulov, UN Berdiyrov, Some aspects of comparing the operational properties of synchronous machines with a conventional and two mutually shifted excitation windings E3S Web of Conferences 10.1051/e3sconf/202340103056 EID: 2-s2.0-85169675134Part of ISSN: 22671242 25550403

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ПРОЕКТИРОВАНИЕ ЭЛЕКТРИЧЕСКИХ ЧАСТЕЙ ФРЕЗЕРНОГО СТАНКА

***Аннотация.** В статье рассматриваются вопросы проектирования электрических частей фрезерного станка. Актуальность исследования обусловлена необходимостью повышения точности, надежности и энергоэффективности металлорежущих станков. Целью работы является разработка и анализ электрической части фрезерного станка с учетом требований к электроприводу, системе управления и защите оборудования.*

***Ключевые слова:** фрезерный станок, электрический привод, электродвигатель, система управления, проектирование.*

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DESIGN OF ELECTRICAL COMPONENTS OF A MILLING MACHINE

***Abstract.** The article addresses the issues related to the design of electrical components of a milling machine. The relevance of the study is обусловлена the need to improve the accuracy, reliability, and energy efficiency of metal-cutting machines. The aim of the work is to develop and analyze the electrical system of a milling machine, taking into account the requirements for the electric drive, control system, and equipment protection.*

***Keywords:** milling machine, electric drive, electric motor, control system, design.*

Введение

Фрезерные станки широко применяются в машиностроении и металлообрабатывающей промышленности для выполнения операций по обработке деталей сложной формы. Качество и производительность обработки во многом определяются характеристиками электрической части станка, включающей электроприводы, системы управления и защиты. Современные требования к автоматизации и энергоэффективности производства обуславливают необходимость тщательного проектирования электрических частей станков. Неправильный выбор электродвигателей и элементов управления может привести к снижению точности обработки, увеличению энергопотребления и ускоренному износу оборудования. Целью данной статьи является анализ принципов проектирования электрических частей фрезерного станка и обоснование выбора основных электротехнических компонентов.

Методы исследования

В процессе проектирования электрической части фрезерного станка применяются следующие методы:

- расчет электрических нагрузок;
- выбор электродвигателей по мощности и режиму работы;
- анализ пусковых и тормозных режимов;
- расчет токов и напряжений в цепях управления и силовых цепях;
- выбор аппаратуры защиты и управления.

Основой исследования является классическая теория электропривода и нормативные требования к металлорежущим станкам.

Структура электрической части фрезерного станка

Электрическая часть фрезерного станка включает следующие основные элементы:

- главный электропривод шпинделя;
- электроприводы подач;
- система управления;
- аппаратура защиты и сигнализации;
- источники питания вспомогательных цепей.

Главный привод шпинделя, как правило, реализуется на базе асинхронного электродвигателя с короткозамкнутым ротором, обеспечивающего надежную и устойчивую работу.

Расчет мощности электропривода

Мощность электродвигателя главного привода определяется исходя из требуемой мощности резания:

$$P_{\text{дв}} = \frac{P_{\text{р}}}{\eta \cdot K_3}$$

где

$P_{\text{дв}}$ — мощность электродвигателя, Вт;

$P_{\text{р}}$ — мощность резания, Вт;

η — коэффициент полезного действия привода;

K_3 — коэффициент запаса мощности.

Мощность резания определяется выражением:

$$P_p = F_p \cdot v$$

где

F_p — сила резания, Н;

v — скорость резания, м/с.

Выбор электродвигателя

Выбор электродвигателя осуществляется с учетом номинальной мощности, частоты вращения и режима работы. Для фрезерных станков наиболее часто применяются асинхронные электродвигатели серии АИР, отличающиеся высокой надежностью и простотой обслуживания.

Номинальный ток электродвигателя определяется по формуле:

$$I_n = \frac{P_{дв}}{\sqrt{3} \cdot U \cdot \cos \varphi \cdot \eta}$$

где

U — линейное напряжение сети;

$\cos \varphi$ — коэффициент мощности.

Система управления и защиты

Система управления электрической частью фрезерного станка включает пускорегулирующую аппаратуру, устройства защиты от перегрузок и коротких замыканий, а также элементы автоматизации. Для защиты электродвигателей применяются автоматические выключатели и тепловые реле. Условие выбора защитного аппарата:

$$I_{зщ} \geq I_n$$

Применение частотно-регулируемого привода позволяет плавно регулировать скорость вращения шпинделя и снизить динамические нагрузки.

Энергоэффективность электрической части

Энергоэффективность фрезерного станка во многом определяется правильным выбором электроприводов и режимов работы. Использование современных систем управления позволяет снизить потребление электроэнергии и повысить ресурс оборудования.

Заключение

В статье рассмотрены основные принципы проектирования электрических частей фрезерного станка. Приведены методы расчета электропривода, выбора электродвигателей и элементов системы управления. Показано, что рациональное проектирование электрической части позволяет повысить надежность, энергоэффективность и производительность станка. Полученные результаты могут быть использованы при проектировании и модернизации металлорежущего оборудования.

Использованные источники:

1. J Nizamov, Sh Ergashov, DI Kurbanbaeva Phase angle measurement device between the resultable electric drive force and the electric drive force of the main

harmonic magnetic field in the air gap of the industrial ...AIP Conference ProceedingsAIP Conf. Proc. 3152, 040021 (2024) <https://doi.org/10.1063/5.0218808>

2. J Nizamov, SO Ergashov, ON Berdiyurov, UN Berdiyurov Device for measuring the resulting magnetic field of the stator winding of asynchronous motor for general industrial application AIP Conference Proceedings AIP Conf. Proc. 3152, 050013 (2024) <https://doi.org/10.1063/5.0218809> June 2024.

3. NB Pirmatov, JA Nizamov, O Ergashev Sh MAGNETIC FIELD IN THE AIR GAP OF AN INDUCTION MOTOR GENERAL INSPECTION INFORMATION APPLICATIONS.

4. M Taniev, U Mirkhonov, M Rakhmatova, F Isakov, S Ergashov, J Nizamov Study of the substitution scheme of the parameters of a phase-rotor induction generator AIP Conference Proceedings Proc. 2552, 060010 (2023). <https://doi.org/10.1063/5.0130746> January 2023.

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МИКРОБИОЛОГИЧЕСКИЙ АНАЛИЗ ФИЛЬТРОВ КОНДИЦИОНЕРОВ В АУДИТОРИЯХ

Аннотация: В статье анализируются микробиологические свойства микроорганизмов, найденных на поверхностях кондиционерных фильтров, размещенных в классах и закрытых пространствах, а также их воздействие на здоровье человека. Выяснено, что кондиционеры, особенно в условиях повышенной влажности, способствуют созданию условий для роста патогенных бактерий, таких как *Legionella*, *Staphylococcus aureus*, *Streptococcus* и грамотрицательные бактерии. Исследования подтвердили доминирование грамотрицательных бактерий на кондиционерных фильтрах, эндотоксины которых могут способствовать возникновению аллергий и заболеваний дыхательных путей. Также на основании научных данных исследована связь систем вентиляции с синдромом больного здания, бронхиальной астмой и болезнями верхних дыхательных путей. В статье подчеркивается важность периодического удаления загрязнений и дезинфекции фильтров кондиционеров для снижения риска распространения инфекционных заболеваний.

Ключевые слова: фильтры систем климат-контроля, микробиологическая контаминация, вредные микроорганизмы, *Легионелла*, *Стафилококк золотистый*, грамотрицательные микроорганизмы, заболевания дыхательных путей, синдром нездорового здания, санитация.

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MICROBIOLOGICAL ANALYSIS OF AIR CONDITIONER FILTERS IN CLASSROOMS

Abstract: *This article explores the microbiological traits of microorganisms present on air conditioner filter surfaces located in auditoriums and enclosed indoor spaces, along with their effects on human health. Research has shown that air conditioning units, particularly in humid settings, foster conditions that promote the proliferation of harmful bacteria, such as Legionella, Staphylococcus aureus, Streptococcus, and Gram-negative bacteria. Research has shown the prevalence of Gram-negative bacteria on air conditioner filters, and their endotoxins might play a role in the onset of allergic and respiratory illnesses. Furthermore, the link between air conditioning systems and sick building syndrome, bronchial asthma, and upper respiratory tract illnesses has been examined using scientific evidence. The piece emphasizes the necessity of routinely cleaning and disinfecting air conditioner filters to inhibit the transmission of infectious diseases.*

Keywords: *filters for air conditioners, microbiological pollution, harmful bacteria, Legionella, Staphylococcus aureus, Gram-negative microorganisms, respiratory illnesses, sick building syndrome, sanitation.*

На поверхности фильтров кондиционеров могут размножаться различные виды микроорганизмов. Влажная среда способствует развитию опасных микроорганизмов, включая бактерию Legionella. Эта бактерия может находиться не только на кондиционерных фильтрах, но и в других влажных зонах, и представляет серьезную угрозу, так как вызывает у человека тяжелые и опасные типы пневмонии.

Для предотвращения появления и распространения патогенных бактерий и микроорганизмов в системах кондиционирования воздуха крайне важно регулярно чистить их фильтры. Эксперты советуют очищать фильтры не реже чем раз в полгода, а по возможности — каждые 2–3 месяца. Также для уменьшения инфекционного риска рекомендуется применять специальные антибактериальные и дезинфицирующие аэрозоли, предназначенные для обработки фильтров кондиционеров. Эти методы существенно уменьшают риск появления патогенных бактерий в устройстве.[1]

Хотя свежий воздух помогает в условиях высокой жары, продолжительное нахождение под кондиционером может привести к таким заболеваниям, как миозит, синусит, гайморит и даже легионеллёз.[5]

В помещениях с системами кондиционирования воздуха уровень распространенности синдрома больного здания (SBS) был на 30–200 % выше, чем в зданиях с естественной вентиляцией. Исследования демонстрируют, что применение кондиционеров непосредственно связано с развитием и тяжестью таких недугов, как бронхиальная астма и ринит. Эпидемия легионеллеза, зафиксированная в 1976 году в Филадельфии (США) и затронувшая 221

человека, из которых 34 случая закончились смертью, привлекла внимание общества к проблеме микробиологического загрязнения кондиционеров. Кроме того, в последние годы регулярное обнаружение вируса SARS-CoV-2 на фильтрах кондиционеров ещё больше подчеркивает значимость проблемы микробиологического загрязнения этих систем.[2]

Поток воздуха, выбрасываемый из кондиционера, влияет на общий микроклимат воздуха в помещении. Таким образом, даже при отключенном кондиционере он может значительно влиять на микробиологический состав воздуха в помещении. В проведенных исследованиях выявлено, что из десяти наиболее распространенных видов бактерий на поверхности фильтров шесть являются грамотрицательными (*Pseudomonas*, *Paracoccus*, *Acinetobacter*, *Methylobacterium*, *Enhydrobacter*, *Sphingomonas*), а четыре — грамположительными (*Staphylococcus*, *Corynebacterium*, *Streptococcus*, *Actinotignum*). Известно, что грамотрицательные бактерии обладают эндотоксинами в клеточной стенке, способными вызывать аллергические реакции у человека и способствовать возникновению заболеваний, связанных с рабочими условиями. Грамположительные бактерии, в свою очередь, имеют значительное значение в процессах колонизации и патогенности микроорганизмов благодаря белкам клеточной стенки. Также при использовании кондиционера в режиме охлаждения на поверхности испарителя образуется конденсат, который создает высокую влажность и создает условия, способствующие интенсивному размножению бактерий.[3]

Микроорганизмы, такие как *Streptococcus* и *Escherichia coli*, могут присутствовать в нормальной микрофлоре организма человека. Тем не менее, бесконтрольное размножение может проявляться клиническими симптомами, такими как боль в горле и ушах, нарушение вкусовых ощущений с гнойными выделениями изо рта, лихорадка, а также дискомфорт в мышцах и суставах. Стрептококковые инфекции часто передаются от человека к человеку, но эти бактерии также могут легко проникать в системы кондиционирования воздуха. К примеру, частицы аэрозоля, выбрасываемые при чихании или кашле рядом с устройством, *dispersone* в воздухе и быстро оседают на фильтрах кондиционера. Следствием загрязнённого воздуха является то, что при повторном запуске кондиционера он может распространяться по комнате и попадать в лёгкие человека через дыхательные пути.

Staphylococcus aureus считается одним из самых угрожающих видов стафилококков. По данным исследований, около 70–80 % жителей планеты являются носителями этой бактерии, при этом у большинства из них заболевание протекает бессимптомно. Тем не менее, при снижении активности иммунной системы *Staphylococcus aureus* начинает проявлять себя, вызывая такие проявления, как боль в горле, затруднённое дыхание или выделения из носа, лёгкий кашель и повышение температуры тела до приблизительно 37 °С. Эта бактерия считается опасной, поскольку она участвует в возникновении более 100 различных заболеваний, включая тонзиллит и пневмонию. Риск заражения увеличивается при вдыхании

воздуха, в котором находятся бактерии от больного человека. Особенно важно, что системы кондиционирования и вентиляции могут распространять микроорганизмы по замкнутым помещениям, что делает их значительным фактором в распространении инфекций стафилококка.[4]

Заключение. Анализ показывает, что фильтры кондиционеров представляют собой значительный источник микробиологического загрязнения в помещениях. Обнаруженные на поверхности фильтров грамотрицательные и грамположительные бактерии, такие как *Legionella*, *Staphylococcus aureus* и *Streptococcus*, могут представлять угрозу для здоровья человека. Влажная обстановка, возникающая в кондиционерах, создаёт подходящие условия для интенсивного роста микроорганизмов и может способствовать появлению респираторных и аллергических заболеваний. Исследования показывают, что синдром больного здания и болезни дыхательных путей чаще встречаются в зданиях с кондиционерами. Регулярное очищение и дезинфекция фильтров кондиционеров, а также строгое выполнение санитарно-гигиенических норм играют ключевую роль в снижении риска инфекций. Эти меры помогают защищать общественное здоровье и поддерживать качество воздуха в помещениях.

Использованные источники:

1. Баранов А.А., Покровский В.И. Инфекционные болезни и санитарно-гигиенические требования к системам вентиляции и кондиционирования воздуха. — Москва: ГЭОТАР-Медиа, 2015. — 240 с.
2. World Health Organization. Indoor air quality: biological contaminants. — Copenhagen: WHO Regional Office for Europe, 2009. — 248 p.
3. Руководство Воз По Качеству Воздуха В Помещениях: Сырость И Плесень — WHO Regional Office for Europe.
4. Grigoriev V.E. Внутрибольничные стафилококковые инфекции и меры их профилактики. — Казанский медицинский журнал. — Том 76, № 2, 1995. — С. 176–179. — DOI: 10.17816/kazmj97264.
5. World Health Organization. Legionella and the prevention of legionellosis. — Geneva: WHO Press, 2007. — 176 p.

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ДИНАМИЧЕСКИЙ АНАЛИЗ ПОСЕВНЫХ ПЛОЩАДЕЙ СЕЛЬСКОГО ХОЗЯЙСТВА В СУРХАНДАРЬИНСКОЙ ОБЛАСТИ

Аннотация: В работе проводится динамический анализ посевных площадей сельского хозяйства в Сурхандарьинской области за выбранный период. Исследуются изменения в структуре и объёмах основных сельскохозяйственных культур, выявляются тенденции расширения или сокращения посевных площадей, а также факторы, влияющие на эти изменения: климатические условия, доступность ирригации, государственные программы поддержки, рыночные цены и технологии возделывания. На основе статистических данных проводится сравнение между годами, выявляются ключевые направления и особенности развития сельскохозяйственного использования земель региона.

Ключевые слова: Посевные площади, динамический анализ, сельское хозяйство, герэкология Сурхандарьинская область, структура посевов, сельскохозяйственные культуры, землепользование, аграрный сектор, орошаемое земледелие, статистический анализ, устойчивое развитие, эффективность землепользования, аграрная политика, климатические факторы, ирригация.

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DYNAMIC ANALYSIS OF AGRICULTURAL ACREAGE IN THE SURKHANDARYA REGION

Abstract : *The paper presents a dynamic analysis of agricultural sown areas in the Surkhandarya region over a selected period. Changes in the structure and volume of major agricultural crops are examined, trends in the expansion or reduction of cultivated areas are identified, and the main factors influencing these changes are analyzed, including climatic conditions, availability of irrigation, government support programs, market prices, and cultivation technologies. Based on statistical data, a comparative analysis between different years is carried out, revealing key directions and specific features of agricultural land use development in the region.*

Keywords: *Sown areas, dynamic analysis, agriculture, geoecology, Surkhandarya region, cropping pattern, agricultural crops, land use, agrarian sector, irrigated agriculture, statistical analysis, sustainable development, land use efficiency, agrarian policy, climatic factors, irrigation.*

Рельеф, климатические и агроклиматические условия Сурхандарьинской области отличают её от других экономических регионов Узбекистана и оказывают прямое влияние на структуру сельскохозяйственных отраслей, виды посевов и уровень урожайности. Основное отличие от других регионов — развитие сельского хозяйства в субтропическом направлении. Здесь созданы благоприятные природные условия для выращивания граната, инжира, фиников, цитрусовых, ранних овощных и бахчевых культур, а также табака. Тёплый климат способствует развитию садоводства и виноградарства, обеспечивая возможность получения раннего урожая.

Из-за естественного дефицита влаги основной отраслью сельского хозяйства региона является орошаемое земледелие. Земли, орошаемые с помощью воды Амударьинской поймы, водохранилищ и каналов, составляют основную опору сельскохозяйственного комплекса области.

Научные основы выделения геосистем Сурхандарьи на геоэкологические районы по парагенетическому принципу и оптимизации геоэкологической ситуации были разработаны (Ярашев К.). Разнообразие природных условий и ландшафтных комплексов Сурхандарьинской поймы привлекло внимание многих географов-исследователей. Вопросами естественно-географического районирования территории и прилегающих регионов занимались Э.М. Мурзаев, В.М. Четыркин, Л.Н. Бабушкин, Н.А. Когай, Ш. Эргашов, П. Баратов, А.А. Абдулкасымов и другие. Одним из первых изучивших Верхний и Нижний Сурхандарьинский региональные комплексы считается В.М. Четыркин.

В процессе естественно-географического районирования территории Республики Узбекистан Сурхандарьинский бассейн был выделен как самостоятельный округ. При делении этого округа на нижестоящие региональные единицы учитывались внутренние различия природных условий и характер структуры ландшафтной организации (Л.Н. Бабушкин и Н.А. Когай). С этой точки зрения бассейн Сурхандарьи был разделён на три

природно-географических района: Нижний Сурхон, Средний Сурхон и Верхний Сурхон. Районирование Сурхандарьинской области на основе типологической карты ландшафтов было выполнено Ш. Эргашевым.

П. Баратов [1; с. 214], выделив Сурхандарьинскую пойму, как округ, разделил её на два природно-географических района: 1) Термиз-Деновский природно-географический район и 2) Шерободский природно-географический район. В состав этих районов входят несколько ландшафтов. Схема природно-географического районирования Сурхандарьинской поймы, предложенная П. Баратовым, значительно отличается от схемы других авторов. В частности, Термиз-Деновский природно-географический район, выделенный П. Баратовым, охватывает почти всю территорию районов Нижний Сурхон, Средний Сурхон и Верхний Сурхон, выделенных другими исследователями. При этом эти природно-географические районы учитывают изменение природных условий Сурхандарьи с юга на север, наличие зональных различий и дифференциацию географических компонентов в данном направлении.

Учёный К.С. Ярашов, занимаясь геоэкологическим районированием Сурхандарьинской поймы, впервые составил её ландшафтно-экологическую карту и на этой основе выделил четыре геоэкологических района:

1. Слабо загрязнённый и деградированный Термизско-Амударьинский долинный геоэкологический район;
2. Сильно деградированный Нижне-Сурхонский оазисно-пустынный геоэкологический район вследствие дефляции и засоления;
3. Средне-Сурхонский оазисно-полупустынный геоэкологический район, загрязнённый химическими соединениями;
4. Верхне-Сурхонский оазисно-степной геоэкологический район, загрязнённый металлогенными пылевыми компонентами.

Для каждого выделенного района имеется ландшафтно-экологическое описание, основанное на качественных и количественных показателях, а также на степени выраженности геоэкологических проблем [2; с. 91].

В 1970 году Ш. Эргашев провёл исследования по районированию ландшафтной территории Сурхандарьинской области, в рамках которых область была разделена на четыре района:

1. Аллювиальные равнины Сурхон-Амударьи;
2. Предгорная равнина Кухитанг-Бойсун;
3. Равнина Туянтау-Бабатог;
4. Горный район Кухитанг-Бойсун.

Исходная территория Сурхандарьинской области является очень древней и прошла сложное геологическое развитие. На древней платформе (после герцинской складчатости), вплоть до палеозойской эры, эта территория представляла собой активную геосинклинальную морскую впадину Центральной Азии. Накопление осадков древнего моря (океан «Тетис») сопровождалось тектонической активностью, и во второй половине палеозоя мощная герцинская складчатость (процесс образования гор) радикально

изменила относительно спокойное тектоническое положение. В результате тектонических разломов, проникновения магмы происходили подъёмы и опускания. Отложения морских и континентальных осадков накапливались в течение длительного времени. Впоследствии на всей территории современного Узбекистана происходило долгосрочное выравнивание гор, формирование равнин и образование платформ [3; с. 30–35].

Изменения посевных площадей сельского хозяйства в Сурхандарьинской области за период 2000–2024 годов свидетельствуют о значительных структурных сдвигах в аграрных секторах. Общие посевные площади в этот период оставались относительно стабильными: с 278,9 тыс. гектаров в 2000 году они уменьшились до 259,8 тыс. гектаров в 2024 году, что составляет 93 % от исходного показателя

Площади зерновых культур. Под площадями зерновых понимаются земли, выделенные для выращивания зерновых культур и занятые культурами, дающими зерно. В эту категорию входят все земли, на которых выращиваются пшеница, ячмень, кукуруза, рис, овёс, рожь и другие зерновые культуры. Площади зерновых имеют важное значение для обеспечения продовольственной безопасности региона, стабильного снабжения внутреннего рынка зерновыми и удовлетворения растущих потребностей населения. Кроме того, ежегодные изменения площадей зерновых служат важным индикатором приоритетов аграрной политики, уровня использования земельных ресурсов и экономической специализации региона. В 2000 году площади зерновых составляли 66,5 тыс. гектаров, тогда как к 2024 году они достигли 118,3 тыс. гектаров, что почти в два раза превышает исходный показатель. Особенно приоритетным направлением государственной политики было расширение площадей пшеницы, которое с конца 2000-годов способствовало обеспечению продовольственной безопасности населения. Значительное увеличение площадей под пшеницу (с 42,1 тыс. гектаров в 2000 году до 110–118 тыс. гектаров в последующие годы) подтверждает заметное увеличение доли зерновых культур в аграрной системе области.

Сокращение площадей под хлопчатник.

Под площадями хлопчатника понимаются земли, выделенные для выращивания хлопка и занятые этой культурой. Эти площади учитываются на уровне области, района или страны и являются основным аграрным показателем, отражающим объём производства хлопка. Площади под хлопчатником имеют экономическое значение, так как они обеспечивают сырьём текстильную промышленность, способствуют росту экспортного потенциала и создают рабочие места в аграрной сфере.

Наибольшие изменения в период 2000–2024 годов наблюдались именно в производстве хлопка. В 2000 году площади хлопчатника составляли 141,7 тыс. гектаров, тогда как к 2024 году они сократились до 79,6 тыс. гектаров, уменьшившись до 56 % от первоначального показателя. Это является прямым результатом политики отказа от монокультуры хлопка, диверсификации посевов и перехода на производство продовольственных культур.

Картофель, овощи и бахчевые культуры. Под площадями картофеля, овощей и бахчевых культур понимаются земли, предназначенные для выращивания продовольственных и рыночных культур, таких как картофель, различные овощи и бахчевые (арбуз, дыня, огурцы, помидоры и др.). Эти площади учитываются на уровне области, района или страны и рассматриваются как важный аграрный показатель с точки зрения продовольственной безопасности, обеспечения внутреннего рынка качественной продукцией и удовлетворения потребительских потребностей.

Посевные площади сельскохозяйственных культур в Сурхандарьинской области (тыс. гектаров)

Н/р	Сельскохозяйствен ные культуры	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	Общая площадь посевов	278,9	278,0	270,3	272,7	273,5	272,3	280,3	283,2	284,3	285,0	267,4
2	Зерновые культуры	66,5	80,8	71739	117,5	122,3	118,9	116,4	121,1	121,0	120,3	118,2
3	В том числе: площадь посевов пшеницы	42,1	56,2	49,2	113,1	117,2	114,6	113,4	118,5	118,5	117,5	114,3
4	Хлопок	141,7	130,9	135,4	122,5	119,4	118,9	119,1	119,6	119,6	117,1	94,5
5	Картофель	1,0	0,63	0,55	6,2	6,7	7,4	9,2	8,8	9,1	9,7	9,9
6	Овощи	3,6	5,0	3,2	9,3	9,5	13,2	14,4	13,3	13,3	15,1	14,6
7	Бахчевые культуры	3,2	2,6	1,6	1,9	2,0	3,1	2,9	3,0	3,1	3,4	2,8
8	Кормовые культуры	61,5	56,7	56,1	10,2	10,2	7,8	16,2	16,4	17,3	18,4	26,0
9	Сады (всего), в том числе:	8,5	10,0	10,5	13,3	14,2	14,4	14,3	15,6	15,5	15,7	16,4
10	сады, включенные в уборку урожая	2,9	3,1	3,7	9,8	10,8	12,2	13,4	15,2	15,5	15,1	13,0
11	Виноградники, в том числе:	15,3	16,0	16,4	14,7	14,4	14,2	13,8	14,2	12,7	13,4	9,6
12	виноградники, включенные в уборку урожая	9,9	10,0	10,1	10,7	12,4	12,3	13,7	14,1	12,7	13,0	8,6

Примечание: картофель, овощи и бахчевые культуры приведены вместе..

Таблица составлена на основе данных Государственного комитета статистики Республики Узбекистан.

Изменение площадей этих культур связано с адаптацией к рыночному спросу, развитием интенсивного земледелия и систем орошения, способствуя повышению урожайности, выращиванию экономически выгодных культур и расширению экспортных возможностей. Кроме того, эти культуры являются важным индикатором диверсификации структуры сельского хозяйства региона. Так как в таблице картофель, овощи и бахчевые культуры объединены, точные значения за 2024 год не указаны. Тем не менее, по сравнению с очень низкими показателями 2000 года заметно резкое расширение площадей с начала 2000-х годов.

Кормовые культуры. Под площадями кормовых культур понимаются земли, предназначенные для производства кормов для животноводства и занятые, главным образом, ячменём, кукурузой, искусственными травами, рисом и другими кормовыми культурами. Эти площади учитываются на уровне области, района или страны и являются важным аграрным показателем, обеспечивающим кормовую базу животноводства, повышение производства молока и мяса, а также подготовку кормов высокого качества.

Изменение площадей кормовых культур связано с политикой развития животноводства, практикой интенсивного земледелия и адаптацией к климатическим условиям региона. Кроме того, эти культуры играют важную роль в рациональном использовании земельных ресурсов и обеспечении диверсификации сельскохозяйственного производства.

Площади кормовых культур уменьшились с 61,5 тыс. гектаров в 2000 году до 28,0 тыс. гектаров в 2024 году, что составляет 45 % от уровня 2000 года. Это указывает на значительные структурные изменения в кормовой базе, внедрение новых видов кормов и переход к интенсивным технологиям животноводства.

Садоводство и виноградники. Под площадями садоводства и виноградников понимаются земли, предназначенные для выращивания фруктов и винограда, то есть совокупность земель, занятых садами и виноградниками. Площади садоводства включают территории с яблонями, абрикосами, грушами, вишней, персиками и другими плодово-ягодными культурами, а виноградники охватывают земли под виноград.

Эти площади учитываются на уровне области, района или страны и имеют важное значение для выращивания высокоценных сельскохозяйственных продуктов, обеспечения внутреннего рынка качественными фруктами и сырьём для виноделия, а также для повышения экспортного потенциала.

Изменение площадей садов и виноградников напрямую связано с аграрной политикой, агроклиматическими условиями региона, использованием водных ресурсов и адаптацией к рыночному спросу. Кроме того, эти площади имеют стратегическое значение для диверсификации структуры сельского хозяйства региона, производства высокоценных продуктов и повышения экономической эффективности. Площади садов увеличились с 8,5 тыс. гектаров в 2000 году до 16,4 тыс. гектаров в 2024 году.

Особенно рост площадей садов, введённых в эксплуатацию (с 2,9 тыс. гектаров до 13,0 тыс. гектаров), свидетельствует о возросшем спросе на многолетние плодовые культуры. В то же время площади виноградников сократились: с 15,3 тыс. гектаров в 2000 году до 9,6 тыс. гектаров в 2024 году. Основной причиной этого процесса является нестабильность рыночных цен, снижение спроса на винодельческое сырьё и перевод части земель под другие культуры.

Заключение Структурные изменения сельскохозяйственных посевных площадей Сурхандарьинской области в период 2000–2024 годов напрямую связаны с приоритетными направлениями аграрной политики, требованиями экономических реформ и конъюнктурой рынка. Результаты исследования показывают, что хотя общая площадь посевов в области существенно не изменилась, внутри их структуры произошёл глубокий и целенаправленный процесс диверсификации.

Во-первых, с целью обеспечения продовольственной безопасности, удовлетворения спроса населения на зерновые продукты и укрепления стабильности внутреннего рынка значительно расширились площади зерновых культур, в частности пшеницы. Увеличение посевов зерновых в 1,8 раза оценивается как важный фактор, определяющий стратегическое направление сельского хозяйства области.

Во-вторых, сокращение площадей под хлопчатником произошло вследствие либерализации аграрного сектора, формирования рыночных механизмов и оптимизации посевов в зависимости от уровня доходности. Сокращение площадей хлопчатника почти в 2 раза дало возможность расширить посевы более экономически эффективных культур, таких как садоводство, овощеводство, бахчеводство и картофелеводство.

В-третьих, увеличение площадей под овощными, бахчевыми культурами и картофелем свидетельствует о росте интенсивного земледелия, а также об увеличении спроса населения на диетические, качественные и свежие продукты. Это создало возможности не только для обеспечения внутреннего рынка, но и для повышения экспортного потенциала Сурхандарьинской области.

В-четвёртых, стабильное расширение садоводческих площадей объясняется благоприятными агроклиматическими условиями, долгосрочной экономической выгодой, высокой доходностью и возможностями экспорта. Рост площадей садов, введённых в эксплуатацию, в 4–5 раз свидетельствует о возросшем интересе к интенсивному выращиванию плодовых культур в регионе.

В-пятых, сокращение площадей виноградников связано с изменением спроса на виноградную продукцию, снижением рыночных цен и уменьшением экономической эффективности отдельных участков. Этот процесс подтверждает, что приоритет отдавался более доходным культурам по сравнению с виноградарством.

В-шестых, перераспределение посевных площадей указывает на повышение эффективности сельскохозяйственного производства, рациональное использование ресурсов и рост адаптации к рыночной экономике. В результате усилилась диверсификация посевов, увеличилась экономическая мотивация хозяйств, а кормовая база для садоводства, овощеводства и животноводства была перестроена.

В целом, изменения посевных площадей в период 2000–2024 годов демонстрируют успешное осуществление процессов диверсификации, эффективного использования ресурсов, внедрения интенсивных технологий и адаптации к рыночным условиям в аграрном секторе Сурхандарьинской области. Эти изменения будут способствовать дальнейшему повышению эффективности сельского хозяйства региона, производству высокоценных продуктов и расширению экспортного потенциала.

Использованные источники:

1. Абдулқосимов А., Жўрақулова Д., Ярашев Қ. “Сурхондарё ботиғи геоэкологик районлаштириш тажрибаси. Табиий ва иқтисодий географик районлаштиришнинг долзарб муаммолари. Республика илмий-амалий конференцияси материаллари”. – Тошкент, 2004. 18-21 Б.
2. Баратов П., “Ўзбекистон табиий географияси” тошкент «укитувчи» 1996 й 214-Б
3. Гвоздецкий Н.А. Основные проблемы физической географии (учеб. пособие). –М.: Высшая школа, 1979. -222 с.
4. Қишлоқ хўжалигида ер ва сув ресурсларидан самарали фойдаланиш концепцияси. Тошкент ш., 2019 йил 17 июнь, ПФ-5742-сон
5. Soliev A., “O'zbekiston geografiyasi” Toshkent 2014 y. «Universitet» 142-160 b
6. Сатторов А. У. Сурхондарё вилояти қишлоқ аҳоли манзилгоҳларининг ривожланиши ва жойлашиш хусусиятлари: Геог. фан. ном. ... дис. автореф. – Тошкент: 2009. – 27 б
7. Yarashev Q.S. Suxondaryo botig'i paragenetik landshaft komplekslari va ularni geoeekologik rayon boshqarish //Geog. fan. bo'y. fal. dokt. diss. avtoref. Toshkent, 2018. 40 b.

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ТЕРРИТОРИАЛЬНЫЙ АНАЛИЗ ЭКОЛОГИЧЕСКОГО СОСТОЯНИЯ СУРХАНДАРЬИНСКОЙ ОБЛАСТИ

Аннотация В данной статье рассматривается экологическое состояние Сурхандарьинской области, её территориальные особенности, значение природных и экономических условий в формировании экологических проблем. Освещаются вопросы экологии территорий, в том числе городов области, влияние промышленных предприятий на окружающую среду, воздействие транспортной системы области на атмосферный воздух, отходы, образующиеся в горнодобывающей промышленности, и их негативное влияние на экологию региона.

Ключевые слова: Экологические проблемы, Сурхандарья, Термез, окружающая среда, природные условия, городская экология, атмосфера, территориальный анализ, промышленные отходы, афганский ветер, засоление.

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TERRITORIAL ANALYSIS OF THE ENVIRONMENTAL CONDITION OF SURKHANDARYA REGION

***Abstract:** This article examines the environmental condition of the Surkhandarya Region, its territorial characteristics, and the significance of natural and economic factors in the formation of ecological problems. The study addresses*

issues of territorial ecology, including urban ecology in the region, the impact of industrial enterprises on the environment, the effect of the regional transport system on atmospheric air, waste generated by the mining industry, and their negative influence on the region's ecology.

Keywords: *Environmental problems, Surkhandarya, Termiz, environment, natural conditions, urban ecology, atmosphere, territorial analysis, industrial waste, Afghan wind, salinization.*

В настоящее время во всём мире экологические проблемы являются одними из наиболее актуальных вопросов, стоящих перед человечеством. Загрязнение атмосферного воздуха, сокращение водных ресурсов, засоление почв, увеличение объёмов отходов и утрата биологического разнообразия относятся к числу таких проблем. В Целях устойчивого развития ООН также предусмотрен ряд программ, направленных на решение экологических проблем, предотвращение их возникновения и обеспечение экологической устойчивости. [7;]. Шестая, одиннадцатая и тринадцатая цели Целей устойчивого развития ООН (всего их 17) посвящены именно экологическим проблемам, и это не случайно.

Согласно статистическим данным, в 2023 году в мировом масштабе объём выбросов углекислого газа в атмосферу составил 36,8 млрд тонн. Кроме того, ежегодно в мире образуется около 2,24 млрд тонн твёрдых бытовых отходов. К 2050 году этот показатель может достичь 3,88 млрд тонн. Ожидается, что к 2040 году объём пластиковых отходов, сбрасываемых в Мировой океан, превысит 37 млн тонн.

Согласно последнему отчёту Программы ООН по окружающей среде (UNEP), в ближайшие годы объём городских отходов увеличится почти в две трети, а стоимость их утилизации возрастет вдвое. В связи с этим обеспечить пригодное для жизни будущее возможно лишь за счёт резкого сокращения объёмов производства отходов.

В 2020 году мировые расходы на управление отходами составили 252 млрд долларов США, а к 2050 году эта сумма может достичь 640,3 млрд долларов. В последние годы и в нашей стране экологическим вопросам уделяется большое внимание как с научной, так и с практической точек зрения.

В Узбекистане был сформирован рейтинг экологической устойчивости 14 административных центров — **Uzbekistan's Green Cities Rating**. Рейтинг включает 7 групп показателей, среди которых: качество воздуха, землепользование, водопотребление, транспорт, энергетика, отходы и санитария.

На сегодняшний день автотранспорт считается основным источником загрязнения воздуха и составляет около 70 % атмосферного загрязнения. Транспорт напрямую загрязняет среду обитания, способствует накоплению свинца и других вредных соединений в организме человека. В городах Ташкент, Самарканд, Бухара и Фергана более 80 % загрязнения воздуха

приходится на долю автотранспорта; аналогичная ситуация наблюдается и в других регионах.

Причиной этого является использование смешанного бензина и дизельного топлива с высоким содержанием серы (так называемого «саярка»). Автомобили, работающие на газовом топливе, составляют более 7 % от общего числа. В более чем 400 тыс. единиц сельскохозяйственной техники, а также в железнодорожном и воздушном транспорте контроль за загрязнением атмосферы не ведётся. На территории Узбекистана также наблюдаются кислотные дожди. Иногда, под воздействием промышленного района Олмалык–Охангарон, кислотные дожди фиксируются даже на территории заповедника Чаткал.

По данным Комитета по экологии, в Узбекистане в течение года образуется 7 млн тонн бытовых отходов. Более 300 предприятий по переработке отходов используют лишь 1,8 млн тонн из них, то есть перерабатывается примерно 25 % бытовых отходов.

Отходы можно классифицировать по различным показателям. Однако самым важным является степень их опасности для здоровья человека. Например, опасные отходы считаются инфекционными, токсичными и радиоактивными. Их сбор и уничтожение регулируются специальными санитарными правилами. Рассмотрим несколько видов классификации отходов. Согласно сообщению SanPIN RUz, порядок сбора, учёта и инвентаризации промышленных отходов, утверждённый 29 июля 2002 года под № 0128-02, определяется с учётом их классов опасности.

Согласно официальным данным, за последние десять лет объём выбрасываемых в атмосферу загрязняющих веществ в стране увеличился почти на 21 %. Территория Узбекистана также относится к экологически сложным регионам.

Район с самой низкой плотностью населения среди районов области — это горный район Байсун. В этом районе на 1 км² приходится в среднем 38 человек. Большая часть Байсунского района покрыта высокими горами, и население в основном сосредоточено вдоль рек, тогда как в других районах население рассредоточено более равномерно.

По состоянию на 1 января 2024 года среди районов области наибольшее население во втором по величине регионе страны приходится на район Денов — 420,2 тыс. человек. Далее следуют районы Кумкурган — 255,5 тыс. человек, Джаркурган — 238,3 тыс. человек, а также районы Шурчи и Сариасийо. Из приведённых данных можно сделать вывод, что высокая численность населения объясняется благоприятными природными условиями: в этих районах широко развиты орошаемое земледелие и значительные площади сельскохозяйственных земель, а также промышленное производство и сельское хозяйство развиты лучше, чем в других районах. Ещё один важный момент: эти районы занимают 44 % общей площади земли области.

Около 70 % территории Сурхандарьинской области занимает предгорная и горная местность, что является одним из основных факторов, формирующих геоэкологические особенности региона. Через центральную часть области протекают реки Сурхандарья и Шерабатдарья. В результате их деятельности образовалась впадина Сурхон–Шерабат. На юге расположена пустыня Каттакум, где преобладают пустынные ландшафты. Такая структура территории оказывает прямое влияние на формирование климата области. Протяжённость территории Сурхандарьинской области составляет 180–200 км с севера на юг и 70–140 км с запада на восток.

В городе Термез на высокое запыление значительное влияние оказывает афганский ветер. Этот ветер сухой, горячий и поднимает пыль, дует с территории Афганистана. В результате в воздухе увеличивается количество пыли.

В южной части области афганский ветер наблюдается в среднем до 28 дней в году. Этот ветер поступает с территорий Ирана и Афганистана и вызывает пылевые бури в районах Термез, Музработ, Ангор, Джаркурбан. Согласно данным прибора «Эколог», концентрация частиц PM10 и PM2,5 в воздухе превышает норму, что ухудшает качество воздуха и оказывает негативное влияние на здоровье человека. Афганский ветер преимущественно наблюдается в летние месяцы, когда в сухих и жарких пустынных районах Афганистана повышается температура воздуха. В это время давление в Афганистане понижается, а в южной части Узбекистана — повышается. В результате поток воздуха движется из Афганистана в Сурхандарьинскую область, в частности в город Термез, из-за разницы давления. Вместе с ветром поднимаются частицы пыли и песка с афганских пустынь. Из-за этого в городе Термез увеличивается запылённость атмосферы, а в некоторых районах концентрация пыли превышает норму. Это указывает на необходимость уменьшения экологических проблем, увеличения числа деревьев, задерживающих пыль, а также важность создания защитных лесополос вдоль направления ветра для снижения поступления афганской пыли.



Во время пылевой бури улица города Термез.

В южной части области афганский ветер наблюдается в среднем до 28 дней в году. Этот ветер поступает с территорий Ирана и Афганистана и вызывает пылевые бури в районах Термез, Музработ, Ангор и Джаркурган. Согласно данным прибора «Эколог», концентрация частиц PM10 и PM2,5 в воздухе превышает норму, что ухудшает качество воздуха и оказывает негативное влияние на здоровье человека.

Афганский ветер преимущественно наблюдается в летние месяцы и возникает в результате повышения температуры воздуха в сухих и жарких пустынных районах Афганистана. В это время давление в Афганистане низкое, а в южной части Узбекистана — высокое. В результате разницы давлений воздушные потоки перемещаются из Афганистана в Сурхандарьинскую область, в частности в город Термез.

С ветром поднимаются частицы пыли и песка с афганских пустынь, из-за чего в Термезе увеличивается запылённость атмосферы. В некоторых районах концентрация пыли в воздухе превышает допустимые нормы. Это указывает на необходимость снижения экологических проблем, увеличения числа деревьев, задерживающих пыль, а также важность создания защитных лесополос вдоль направления ветра для уменьшения поступления афганской пыли.

9 июня 2023 года лабораторией Управления природных ресурсов Сурхандарьинской области был проведён анализ качества атмосферного воздуха в городе Термез. Результаты анализа показали, что в некоторых районах концентрация пыли превышает норму (Таблица 1).

Таблица 1

Название региона	Допустимая норма пыли (мг/м³)	Результаты анализа (мг/м³)	Соответствие требованиям
Перед торговым центром «Indenim»	0,5	0,53	Выше нормы
Улица «Ибн Сино»	0,5	0,5	В пределах нормы
Улица «Фидокор»	0,5	0,6	Выше нормы
Окрестности Международного аэропорта Термеза	0,5	0,62	Выше нормы

Концентрация пыли в воздухе на территории города Термез (по состоянию на 09.06.2023)

Источник: Данные аналитической лаборатории Управления природных ресурсов Сурхандарьинской области и нормы SanPIN RUz №0293-11.

Согласно приведённым данным таблицы, в некоторых районах города Термез концентрация пыли в воздухе превышает допустимые нормы. В частности, повышенное содержание пыли зафиксировано перед торговым центром «Indenim», на улице «Фидокор» и в окрестностях Международного

аэропорта Термеза. Это указывает на рост уровня загрязнения атмосферы в городе. Только на улице «Ибн Сино» результаты измерений находились в пределах нормы.

В 2024 году в районе газового месторождения, посвящённого 25-летию Независимости, расположенного в махалле Кофрун Бойсунского района Сурхандарьинской области, был зафиксирован выброс сероводорода. Это происшествие произошло из-за несоблюдения правил технической безопасности при буровых работах на природных газовых месторождениях. Сероводород крайне опасен для здоровья человека: его попадание в воздух повреждает дыхательные пути и может вызвать отравление. Инцидент в Кофруне оказал негативное воздействие не только на людей, но и на окружающую среду. Газ смешался с атмосферным воздухом, загрязнив его, а также негативно повлиял на растения и животный мир.

Подводя итог, можно сказать, что происшествие с газом в Бойсунском районе подчёркивает необходимость строгого соблюдения экологической безопасности и технического контроля при использовании природных ресурсов. Для предотвращения подобных ситуаций в будущем крайне важно усилить экологический мониторинг, совершенствовать системы безопасности и принимать меры по защите населения.

В области также встречаются такие экологические проблемы, как эрозия почв, опустынивание, сокращение лесов и неправильное размещение отходов. Для их решения необходимо повышать экологическую культуру населения, улучшать систему переработки отходов и увеличивать площади зелёных зон, что позволит хотя бы частично снизить негативное воздействие.

Кроме того, Государственный заповедник Сурхон играет важную роль в сохранении биологического разнообразия, так как здесь обитают редкие виды растений и животных. Расширение природоохранных зон помогает поддерживать экологический баланс.

По состоянию на конец 2020 года объём загрязняющих веществ в атмосферном воздухе по Узбекистану составил 924,4 тыс. тонн. При анализе по регионам Сурхандарьинская область имела наименьшую долю — 0,7 %, что объясняется относительно низкой интенсивностью промышленной и транспортной деятельности в регионе. Поэтому объём выбросов загрязняющих веществ в атмосферу здесь ниже, чем в других областях.

Заключение

Для улучшения геоэкологического состояния Сурхандарьинской области крайне важно рационально использовать природные ресурсы, охранять водные и земельные ресурсы, сокращать образование отходов и повышать экологическую культуру населения. Хотя природные условия области благоприятны для развития сельского хозяйства и туризма, сохранение экологического баланса остаётся первостепенной задачей для будущих поколений.

В последние годы в связи с ростом промышленности, транспорта и численности населения увеличилось загрязнение воздуха, воды и почвы.

Использование месторождений природного газа, нефти и угля, в частности инцидент с газом в Кофруне Бойсунского района, подчёркивает необходимость уделять серьёзное внимание вопросам экологической безопасности. Кроме того, такие природные явления, как афганский ветер, также влияют на климат и природу области. Жаркие и сухие ветры способствуют сокращению растительного покрова и ухудшают условия обитания животных.

Основными экологическими проблемами региона являются загрязнение атмосферного воздуха, сокращение водных ресурсов, засоление почв и проблема отходов. Особенно остро эта проблема проявляется в городе Термез и его окрестностях, где увеличилось количество промышленных отходов. Для предотвращения этих явлений необходимо совершенствовать систему экологического мониторинга, установить строгий контроль за защитой атмосферного воздуха и водных ресурсов, внедрять технологии сокращения и переработки отходов, а также восстанавливать природные ландшафты и расширять зелёные зоны. Кроме того, из плана экологических мероприятий Сурхандарьинской области, рассчитанного на 2,5 года до 2025 года, видно, что особое внимание уделяется обеспечению экологической безопасности, снижению загрязнения и адаптации к изменению климата. Проект «Зелёное пространство», включающий управление отходами, мониторинг воздуха и воды, играет важную роль в улучшении экологии региона.

Использованные источники:

1. Д. Ёрматова, Ш. Убайдуллаев. *Экологический мониторинг* – учебное пособие. «Фан ва техника», 2012.
2. А.Н. Ходжматов. *Экологический мониторинг* – учебное пособие. «Тафаккур авлоди», 2020.
3. *Городская экология* – методическое пособие, Ташкент, 2013.
4. А. Ергашев, М. Юлчиева, О. Ахмедов, А. Абзалов. *Общая экология*, Ташкент, 2014.
5. Debananda Roy, Jayun Kim, Minjoo Lee, Joonhong Park (2023). Adverse impacts of Asian dust events on human health and the environment—A probabilistic risk assessment study on particulate matter-bound metals and bacteria in Seoul, South Korea. *Science of The Total Environment* Volume 875, 1 June 2023, 162637 <https://doi.org/10.1016/j.scitotenv.2023.162637> (время обращения: 21.07.2025)
6. Целям устойчивого развития ООН (ЦУР 6, ЦУР 15,). <https://www.un.org/sustainabledevelopment/ru/sustainable-development-goals/> (время обращения: 14.12.2025)
7. Указ Президента Республики Узбекистан 31.05.2023 г. № УП-81 О мерах по трансформации сферы экологии и охраны окружающей среды и организации деятельности уполномоченного государственного органа <https://lex.uz/docs/-6479180?ONDATE> (время обращения: 14.12.2025)

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СОВЕРШЕНСТВОВАНИЕ МЕТОДИКИ ИСПОЛЬЗОВАНИЯ ЦИФРОВЫХ И AI-ИНСТРУМЕНТОВ ДЛЯ ПОВЫШЕНИЯ УРОВНЯ КОМПОЗИЦИОННОГО МЫШЛЕНИЯ СТУДЕНТОВ ВУЗОВ

***Аннотация:** В настоящей статье всесторонне рассматривается проблема развития композиционного мышления — ключевой метакомпетенции будущего специалиста — в системе высшего образования Республики Узбекистан в условиях её активной цифровизации. Анализируются методологические аспекты трансформации педагогических подходов под влиянием технологий искусственного интеллекта и цифровых сред, способных выступать не только как вспомогательные инструменты, но и как интеллектуальные катализаторы творческого и структурного мышления. Особый акцент делается на поиске баланса между развитием фундаментальных когнитивных способностей и эффективным использованием инновационного технологического потенциала для создания персонализированной образовательной траектории. В ходе исследования предоставляется авторская методическая разработка «AI-ассистируемый структурный синтез».*

***Ключевые слова:** композиционное мышление, цифровые инструменты, искусственный интеллект, высшее образование, Узбекистан, методика*

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IMPROVING THE METHODOLOGY OF USING DIGITAL AND AI TOOLS TO IMPROVE THE LEVEL OF COMPOSITIONAL THINKING OF UNIVERSITY STUDENTS

Abstract: *This article comprehensively examines the development of compositional thinking—a key metacompetence for future specialists—in the higher education system of the Republic of Uzbekistan in the context of its active digitalization. It analyzes the methodological aspects of the transformation of pedagogical approaches under the influence of artificial intelligence technologies and digital environments, which can act not only as auxiliary tools but also as intellectual catalysts for creative and structural thinking. Particular emphasis is placed on finding a balance between the development of fundamental cognitive abilities and the effective use of innovative technological potential to create a personalized educational trajectory. The study presents the author's methodological development, "AI-Assisted Structural Synthesis."*

Keywords: *compositional thinking, digital tools, artificial intelligence, higher education, Uzbekistan, methodology.*

Введение: В условиях активной цифровизации образования в Узбекистане, обозначенной в государственных стратегиях [1], особую актуальность приобретает задача развития композиционного мышления студентов — способности целостного проектирования и структурирования сложных объектов и процессов[2]. Традиционные педагогические подходы требуют модернизации с учетом потенциала новых технологий. Внедрение цифровых и искусственного интеллекта инструментов, таких как специализированное программное обеспечение для ментального картоирования [3], AI-ассистенты для анализа структурной логики текстов, интерактивные платформы для трехмерного моделирования композиций, открывает возможности для создания персонализированной и визуально насыщенной образовательной среды.

Методика «AI-ассистированный структурный синтез». Данная методика нацелена на поэтапное формирование навыков композиционного моделирования с использованием инструментов искусственного интеллекта в качестве интеллектуального партнера. На первом, аналитическом, этапе студенты работают с AI-платформами, способными деконструировать сложные объекты (архитектурные ансамбли, литературные произведения, бизнес-процессы) на составные элементы, выявляя иерархические связи и структурные паттерны [4,5]. В качестве учебного материала целесообразно использовать цифровые копии объектов культурного наследия Узбекистана, что обеспечивает содержательную связь с национальным контекстом. AI-инструмент здесь выполняет функцию интерактивного анализатора, визуализируя логику целого и предлагая варианты его смыслового каркаса.

На втором, синтетическом, этапе обучающиеся переходят к созданию собственных композиционных решений в заданной предметной области.

Используя AI-генеративные сервисы (например, для создания схем, черновиков текстов или макетов), студенты получают несколько вариантов структурной организации своих идей, которые затем подвергают критической экспертизе, сравнительному анализу и ручной доработке. Ключевым педагогическим условием является обязательная рефлексия, в ходе которой студенты аргументируют выбор окончательной композиции, объясняя, почему предложенные AI варианты были приняты, модифицированы или отвергнуты. Таким образом, методика выстраивает цикл «анализ → генерация → критический отбор → обоснование», где цифровой инструмент не подменяет мышление, а интенсифицирует и обогащает процесс структурного творчества.

Результат: Пилотное исследование, проведённое на базе технического и гуманитарного факультетов одного из вузов Узбекистана в течение академического семестра, продемонстрировало её значимую эффективность. Сравнительный анализ контрольной и экспериментальной групп показал, что у 78% студентов, работавших по предложенной методике, отмечен качественный рост в умении выявлять структурные взаимосвязи в сложных системах, что подтвердилось результатами выполнения стандартизированных кейс-заданий. Особенно показательным стал прогресс в способности к вариативному моделированию: если на входном тестировании лишь 25% обучающихся могли предложить более двух альтернативных структурных схем проекта, то по итогам курса этот показатель в экспериментальной группе достиг 67%. Качественный анализ работ выявил возрастающую сложность и логическую обоснованность создаваемых композиций. Важным субъективным результатом стало изменение отношения студентов к цифровым инструментам. На начальном этапе 60% респондентов рассматривали AI преимущественно как средство для генерации готового результата.

Таблица 1.

Перечень основного оборудования и программного обеспечения,
использованного в исследовании

Категория	Наименование оборудования / ПО	Назначение в исследовании
Аппаратное обеспечение	Персональные компьютеры и ноутбуки	Базовая рабочая станция для выполнения заданий и работы с ПО.
	Интерактивные панели или проекторы	Визуализация учебных материалов, групповой анализ структур и результатов работы студентов.
Цифровые ресурсы	Оцифрованные архивы объектов культурного наследия Узбекистана	Предоставление аутентичного материала для анализа и проектирования в национальном контексте.

Заключение: В свете амбициозных задач по построению «цифрового Узбекистана» интеграция искусственного интеллекта в педагогику открывает новые горизонты для воспитания творческого интеллекта нации. Совершенствование композиционного мышления через симбиоз

классических традиций упорядочивания знаний и передовых цифровых инструментов готовит не просто исполнителей, а архитекторов будущего — способных к синтезу идей, проектированию сложных систем и созиданию инноваций на основе богатого культурного кода страны. Этот путь превращает технологический прогресс в мост между великим наследием прошлого и устойчивым развитием завтрашнего дня.

Использованные источники:

1. Терехова Е. С., Пучкова Н. Н., Ганова Т. В. Особенности машинного творчества и возможности его применения в процессе обучения студентов-дизайнеров // Научное мнение. - СПб.: Санкт-Петербургский университетский консорциум, 2021. - № 10. - С. 60-66.
2. Тьюринг А. Вычислительные машины и разум / [пер. с англ. К. Королева]. - М.: Издательство АСТ, 2018. - 128 с.
3. Сабзалиева Э., Валентини А. ChatGPT и искусственный интеллект в высшем образовании // Цифровая библиотека UNESDOC. - URL: https://unesdoc.unesco.Org/ark:/48223/pf0000385146_rus
4. Moorhouse B. L., Yeo M. A., Wan Y. Generative AI tools and assessment: Guidelines of the world's top-ranking universities // Computers and Education Open. - 2023. - URL: <https://www.sciencedirect.com/science/article/pii/S2666557323000290>
5. Garcia-Penalvo F. J. Generative Artificial Intelligence: New Scenarios in Teaching, Learning, and Communication // VIII Congreso Internacional de Estudios sobre Medios de Comunicac (Universidad Complutense de Madrid, September 6th, 2023).

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ПРИМЕНЕНИЕ D-BUS ДЛЯ УПРАВЛЕНИЯ GNOME В ОС АЛЬТ. ВОПРОСЫ БЕЗОПАСНОСТИ

***Аннотация:** Статья посвящена анализу применения механизма межпроцессного взаимодействия D-Bus для управления графической средой GNOME в операционной системе Альт. Рассматриваются возможности управления компонентами GNOME через сессионную шину D-Bus с использованием инструментов busctl, gsettings и dbus-monitor. Особое внимание уделено вопросам безопасности: анализируются стандартные политики доступа сессионной шины, выявляются потенциальные уязвимости (несанкционированное управление, spoofing сигналов, DoS-атаки, утечки информации) в многопользовательских сценариях и при интеграции с Alterator. Предложены практические рекомендации по повышению безопасности путём создания кастомных политик. Исследование проведено на ОС Альт Рабочая станция 11.0, подтверждены гипотезы об эффективности D-Bus и недостаточной строгости стандартных политик.*

***Ключевые слова:** D-Bus, GNOME, ОС Альт, межпроцессное взаимодействие, сессионная шина, политики безопасности, уязвимости безопасности*

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USING D-BUS TO CONTROL GNOME IN ALT OS. SECURITY ISSUES

***Annotation:** The article is devoted to the analysis of the use of the D-Bus interprocess communication mechanism for managing the GNOME graphical environment in the Alt operating system. The possibilities of controlling GNOME components through the session D-Bus are considered using tools such as busctl, gsettings, and dbus-monitor. Particular attention is paid to security issues: standard session bus access policies are analyzed, potential vulnerabilities (unauthorized control, signal spoofing, DoS attacks, information leakage) in multi-user scenarios and integration with Alterator are identified. Practical*

recommendations for improving security by creating custom policies. The study was conducted on Alt Workstation 11.0; the hypotheses about the effectiveness of D-Bus and the insufficient strictness of standard policies were confirmed.

Keywords: D-Bus, GNOME, Alt Linux, interprocess communication, session bus, security policies, security vulnerabilities

Введение

В современных дистрибутивах Linux на базе графических сред рабочего стола, таких как GNOME, ключевую роль играет механизм межпроцессного взаимодействия (IPC). В операционной системе Альт (разработка компании BaseALT) GNOME является основной графической оболочкой в редакциях Рабочая станция и Сервер с графическим интерфейсом. Здесь GNOME интегрируется с инструментами администрирования, включая Центр управления системой (Alterator на D-Bus).

D-Bus выступает стандартом де-факто для IPC в desktop-окружениях Linux, обеспечивая обмен сообщениями между компонентами GNOME (настройками, уведомлениями, расширениями, сессиями). Исследования разработчиков freedesktop.org и GNOME Foundation подтверждают эффективность D-Bus, но выявляют риски безопасности: слабые политики доступа в сессионной шине могут привести к несанкционированному управлению компонентами, эскалации привилегий или DoS-атакам.

D-Bus (Desktop Bus) представляет собой систему межпроцессной коммуникации (IPC), разработанную в рамках проекта freedesktop.org. Это механизм, позволяющий приложениям обмениваться сообщениями в низкозатратном и низкозадержанном режиме. D-Bus состоит из нескольких слоев: библиотеки для прямого соединения (libdbus), демона (dbus-daemon), который управляет обменом сообщениями, и спецификаций для интерфейсов. Стандарт D-Bus определяет формат сообщений, включая заголовки, типы данных и сигнатуры методов. Основные компоненты включают системную шину (system bus) для глобальных сервисов и сессионную шину (session bus) для пользовательских сессий. D-Bus широко используется в десктопных окружениях, таких как GNOME, для координации процессов, управления настройками и уведомлениями [2]. Спецификация D-Bus доступна на официальном сайте проекта, где описаны протоколы, типы сообщений и правила валидации [5].

В ОС Альт D-Bus активно используется в Alterator для взаимодействия модулей в графической среде. Настоящее исследование анализирует применение D-Bus для управления GNOME в ОС Альт, детально рассматривает вопросы безопасности и предлагает рекомендации по минимизации рисков на основе практических примеров.

Объект, предмет и цель

Объект исследования — механизмы межпроцессного взаимодействия в графической среде GNOME операционной системы Альт.

Предмет исследования — применение шины D-Bus (сессионной и системной) для управления компонентами GNOME, включая конфигурацию политик доступа и потенциальные уязвимости безопасности.

Цель исследования — детально проанализировать возможности и практику применения D-Bus для управления GNOME в ОС Альт; выявить и классифицировать угрозы безопасности, связанные с политиками доступа и межпроцессным взаимодействием; предложить практические рекомендации по повышению безопасности на основе экспериментальных данных из среды ОС Альт; подтвердить или опровергнуть гипотезы о рисках в стандартной конфигурации.

Литературный обзор

D-Bus — система межпроцессного общения, разработанная в проекте freedesktop.org. Она включает системную шину (system bus) для глобальных событий и сессионную шину (session bus) для пользовательских сессий.

В GNOME D-Bus управляет настройками (org.gnome.desktop.interface), уведомлениями и расширениями. В ОС Альт D-Bus интегрирован в Alterator, где модули обмениваются данными через шину для графического администрирования.

Анализ исследований (спецификация D-Bus, документация GNOME) показывает уязвимости:

- По умолчанию сессионная шина разрешает широкие права (allow own="", allow_send_destination=""), что позволяет процессам одного пользователя влиять на другие в многопользовательских сценариях.

- Известны CVE (например, связанные с spoofing сигналов в GLib, утечками в gnome-remote-desktop, DoS через исчерпание FD).

- Политики доступа настраиваются в файлах /usr/share/dbus-1/session.conf и /etc/dbus-1/session.d/.

Публикации по использованию D-Bus для управления GNOME, особенно в контексте безопасности, охватывают введение в протокол, его интеграцию в десктопные окружения и потенциальные уязвимости. В статье "Введение в D-BUS" на OpenNET подчеркивается, что D-Bus заменяет более сложные системы вроде CORBA в GNOME, интегрируясь с HAL для управления оборудованием, и обсуждаются аспекты безопасности через политики доступа в конфигурационных файлах [3]. Статья "Тотальный контроль приложений с системой D-Bus" в журнале Хакер описывает, как D-Bus позволяет управлять приложениями в GNOME и KDE через команды вроде dbus-send, но предупреждает о рисках неавторизованного доступа и необходимости аутентификации для предотвращения уязвимостей в системах [4].

В контексте интеграции с systemd, публикация "GNOME адаптирован для управления через systemd" на OpenNET отмечает, что gnome-session использует D-Bus для управления сессиями, что повышает безопасность через sandboxing, но требует systemd для полной функциональности [5]. По вопросам безопасности, статья на Linux.org.ru о семилетнем баге в Polkit

(CVE-2021-3560) объясняет, как уязвимость позволяет эскалацию привилегий через D-Bus в GNOME, используя dbus-send для обхода аутентификации, что актуально для дистрибутивов вроде Ubuntu и потенциально ALT [6]. Аналогично, на Anti-Malware.ru обсуждается уязвимость в GNOME AccountsService (CVE-2021-3939), где через D-Bus можно получить root-доступ в Ubuntu, подчеркивая необходимость патчей для Linux-систем [7].

Для ALT Linux, публикация "Опубликована одиннадцатая платформа ALT" на OpenNET упоминает интеграцию D-Bus в Alterator для системного управления, включая GNOME 46, с акцентом на безопасность через MAC и TLS в сервисах [8]. В целом, публикации подчеркивают полезность D-Bus для управления GNOME в ALT, но акцентируют внимание на настройке политик и обновлениях для минимизации рисков, с редкими упоминаниями иностранных источников для базовых спецификаций.

Гипотезы исследования:

1. D-Bus эффективно управляет GNOME в ОС Альт через инструменты вроде dbus-send и gsettings.
2. Стандартные политики сессионной шины в GNOME ОС Альт недостаточно строгие, создавая риски несанкционированного доступа.
3. Кастомные политики в /etc/dbus-1/session.d/ позволяют ограничить риски без потери функциональности.

Методы исследования

Тип исследования — прикладное экспериментальное, сочетающее анализ документации, конфигурационных файлов и практическое тестирование команд в реальной среде.

Характеристика выборки — исследование проводилось на операционной системе Альт Рабочая станция версии 11.0 (актуальной на дату исследования) с установленной графической средой GNOME по умолчанию. Тестирование выполнялось в одиночной и имитированной многопользовательской сессии (с несколькими пользователями).

Цель исследования (детализация в контексте методов): достижение цели осуществляется через последовательные этапы — от анализа стандартной конфигурации D-Bus и GNOME до тестирования управления компонентами, выявления уязвимостей и применения мер защиты. Это позволяет не только описать функциональность, но и количественно/качественно оценить риски безопасности.

Методы сбора данных:

- Анализ официальной документации ОС Альт (разделы по Alterator на D-Bus и GNOME).
- Осмотр конфигурационных файлов D-Bus (/usr/share/dbus-1/session.conf, /etc/dbus-1/session.d/).
- Использование утилит: busctl --user, dbus-send, gdbus, dbus-monitor для просмотра и взаимодействия с шиной.

Описание процедуры проведения исследования:

1. Установка и запуск ОС Альт Рабочая станция с GNOME.
2. Запуск GNOME-сессии, проверка наличия сессионной шины (echo \$DBUS_SESSION_BUS_ADDRESS).
3. Просмотр активных сервисов: busctl --user tree.
4. Тестирование управления: изменение настроек GNOME через D-Bus (gdbus call).
5. Анализ стандартных политик: cat /usr/share/dbus-1/session.conf.
6. Симуляция угроз: попытки отправки сообщений от одного пользователя к сервисам другого (в многопользовательском режиме).
7. Применение кастомных политик: создание файла в /etc/dbus-1/session.d/, перезапуск сессии, верификация ограничений.
8. Мониторинг событий: dbus-monitor --session.

Методы обработки данных — качественный анализ вывода команд, интерпретация политик доступа, сравнение поведения до и после применения ограничений.

Результаты исследования

В ОС Альт GNOME полностью зависит от сессионной шины D-Bus. Практические примеры управления:

1. Просмотр сервисов:
busctl --user tree

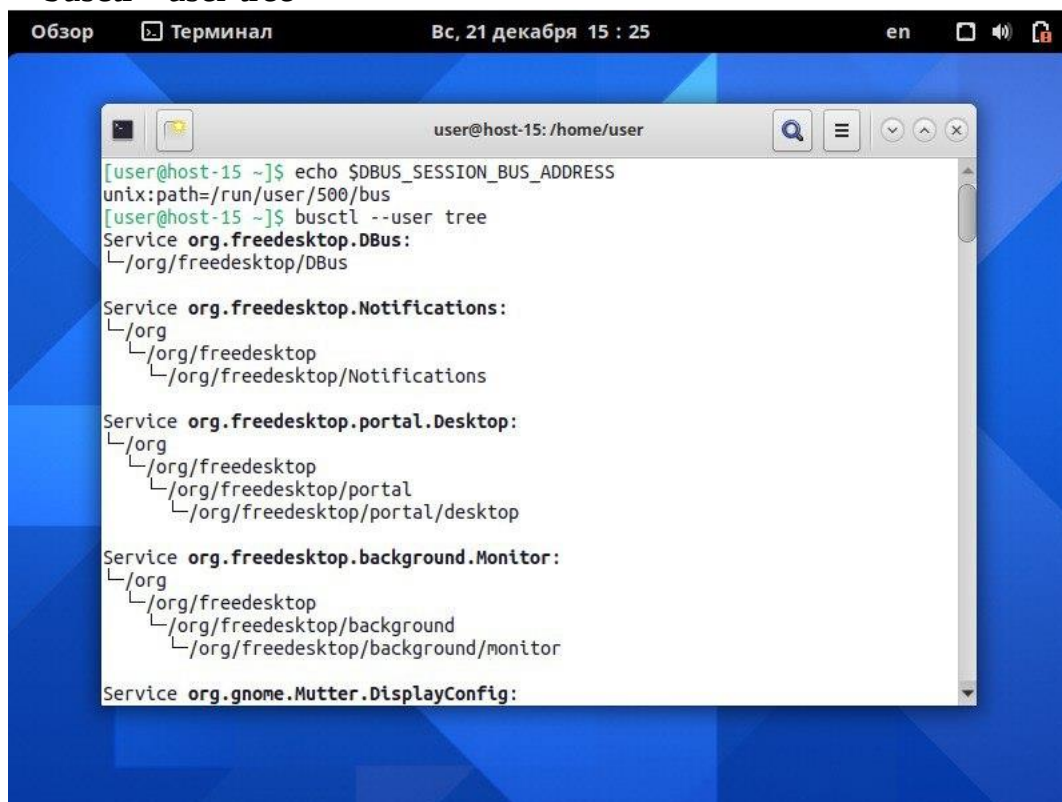


Рисунок 1 – Просмотр сервисов

Вывод включает org.gnome.Shell (управление оболочкой), org.gnome.SettingsDaemon (настройки), org.gnome.Mutter (оконный менеджер), org.freedesktop.portal.Desktop (порталы для sandbox).

2. Изменение настроек:

`gsettings set org.gnome.desktop.interface gtk-theme 'Adwaita-dark'`

A screenshot of a terminal window titled "Обзор Терминал" with a timestamp of "Вс, 21 декабря 15 : 40". The terminal shows a root user at host-15. The commands entered are: `gsettings set org.gnome.desktop.interface gtk-theme 'Adwaita-dark'` and `gsettings get org.gnome.desktop.interface gtk-theme`. The output of the second command is `'Adwaita-dark'`.

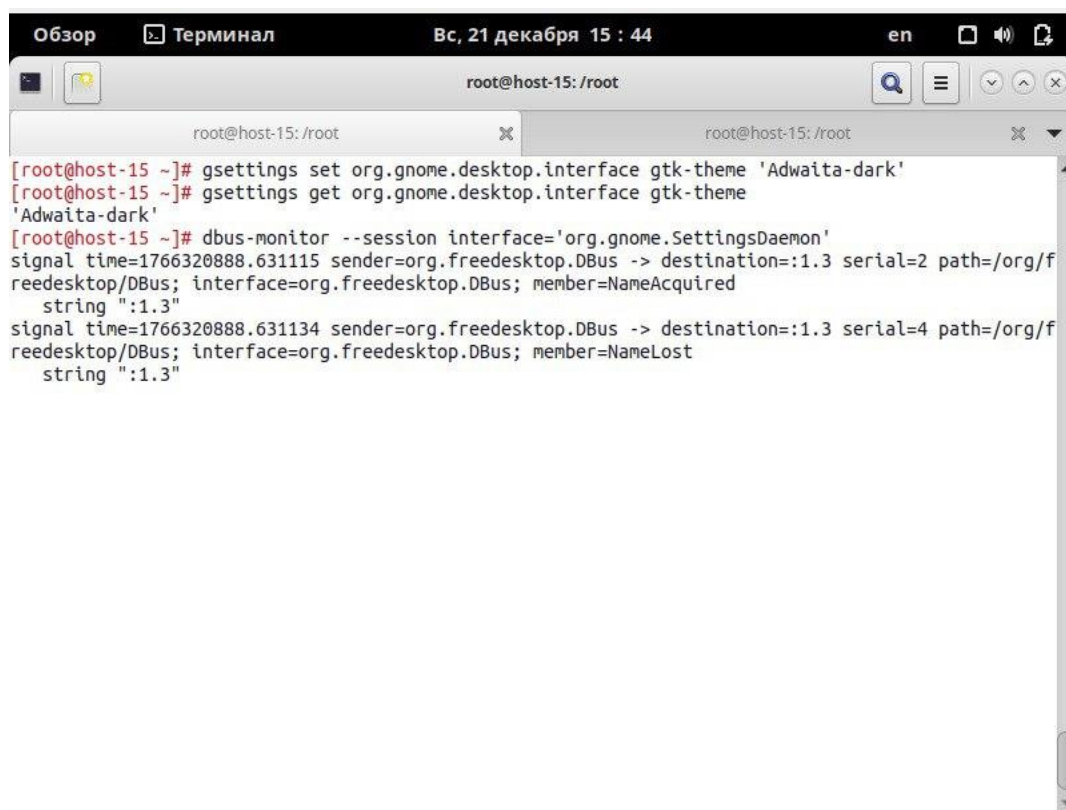
```
[root@host-15 ~]# gsettings set org.gnome.desktop.interface gtk-theme 'Adwaita-dark'
[root@host-15 ~]# gsettings get org.gnome.desktop.interface gtk-theme
'Adwaita-dark'
[root@host-15 ~]#
```

Рисунок 2 – Изменение настроек

Применяет тёмную тему; эквивалент через `gdbus` для свойств; также включение `night-light`: `gsettings set org.gnome.settings-daemon.plugins.color night-light-enabled true`.

3. Мониторинг:

`dbus-monitor --session interface='org.gnome.SettingsDaemon'`



The screenshot shows a terminal window titled "Обзор Терминал" with the date and time "Вс, 21 декабря 15 : 44". The terminal prompt is "root@host-15: /root". The user has entered the following commands and received the following output:

```
[root@host-15 ~]# gsettings set org.gnome.desktop.interface gtk-theme 'Adwaita-dark'
[root@host-15 ~]# gsettings get org.gnome.desktop.interface gtk-theme
'Adwaita-dark'
[root@host-15 ~]# dbus-monitor --session interface='org.gnome.SettingsDaemon'
signal time=1766320888.631115 sender=org.freedesktop.DBus -> destination=:1.3 serial=2 path=/org/freedesktop/DBus; interface=org.freedesktop.DBus; member=NameAcquired
  string ":1.3"
signal time=1766320888.631134 sender=org.freedesktop.DBus -> destination=:1.3 serial=4 path=/org/freedesktop/DBus; interface=org.freedesktop.DBus; member=NameLost
  string ":1.3"
```

Рисунок 3 - Мониторинг

Позволяет наблюдать сигналы изменений (громкость, питание); `busctl -user monitor` для конкретных сервисов.

Вопросы безопасности:

Стандартная конфигурация сессионной шины (файл `/usr/share/dbus-1/session.conf`) содержит permissive-политики:

- `<allow own=""/>` — любой процесс может владеть именем.
- `<allow send_destination=""/>` — свободная отправка сообщений.

```
root@host-15: /root

<!-- On Unix systems, the most secure authentication mechanism is
EXTERNAL, which uses credential-passing over Unix sockets.

This authentication mechanism is not available on Windows,
is not suitable for use with the tcp: or nonce-tcp: transports,
and will not work on obscure flavours of Unix that do not have
a supported credentials-passing mechanism. On those platforms/transports,
comment out the <auth> element to allow fallback to DBUS_COOKIE_SHA1. -->
<auth>EXTERNAL</auth>

<standard_session_servicedirs />

<policy context="default">
  <!-- Allow everything to be sent -->
  <allow send_destination="*" eavesdrop="true"/>
  <!-- Allow everything to be received -->
  <allow eavesdrop="true"/>
  <!-- Allow anyone to own anything -->
  <allow own="*" />
</policy>

<!-- Include legacy configuration location -->
<include ignore_missing="yes">/etc/dbus-1/session.conf</include>

<!-- Config files are placed here that among other things,
further restrict the above policy for specific services. -->
<includedir>session.d</includedir>
```

Рисунок 4 – Стандартная конфигурация сессионной шины

Это создает риски:

- Несанкционированное управление: В многопользовательской системе (несколько пользователей на одном ПК) процесс одного пользователя может отправлять сообщения сервисам GNOME другого, изменяя настройки или инъецируя события.
- Spoofing сигналов: Вредоносное приложение может эмулировать сигналы от trusted-сервисов (известно по CVE в GLib/GDBus).
- DoS: Исчерпание file descriptors или соединений.
- Утечки информации: В некоторых расширениях GNOME (например, remote desktop) возможны утечки через неавторизованные интерфейсы.

В ОС Альт риски аналогичны стандартному GNOME, но усиливаются интеграцией с Alterator на D-Bus: несанкционированный доступ к модулям администрирования возможен в сессии.

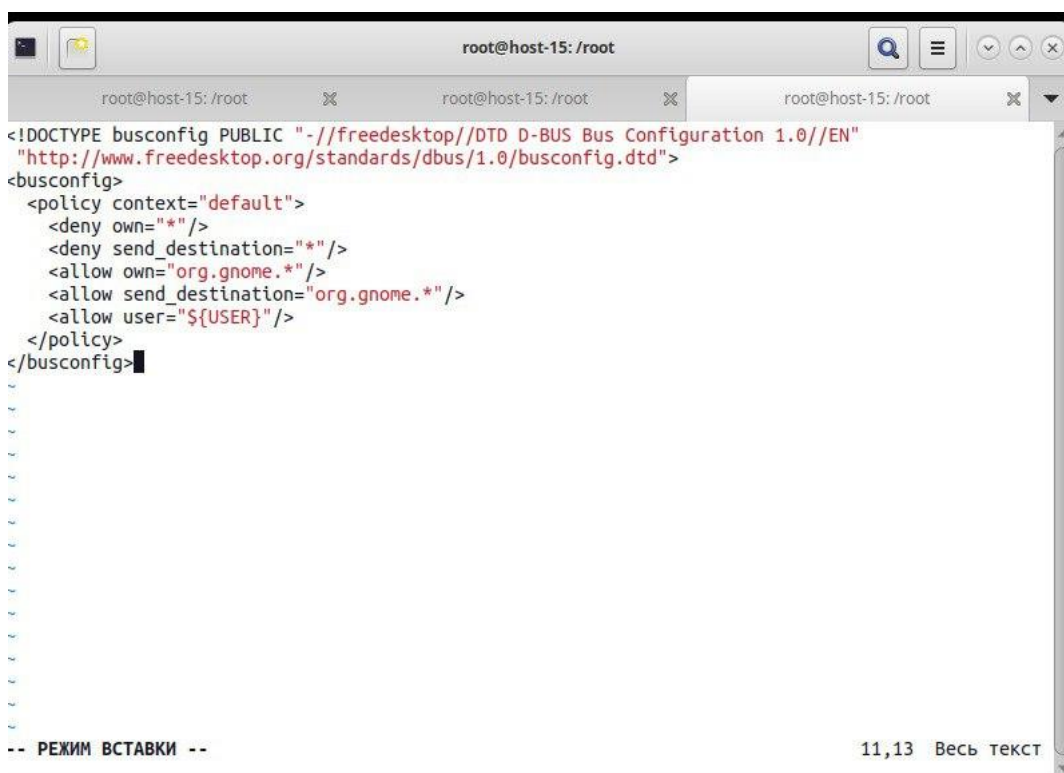
Рекомендации по защите:

Создать файл `/etc/dbus-1/session.d/gnome-restrict.conf`, с содержимым:

```
root@host-15: /root

[root@host-15 ~]# touch /etc/dbus-1/session.d/gnome-restrict.conf
[root@host-15 ~]# vim /etc/dbus-1/session.d/gnome-restrict.conf
[root@host-15 ~]#
```

Рисунок 5 – Создание файла политик безопасности



```
root@host-15: /root
<!DOCTYPE busconfig PUBLIC "-//freedesktop//DTD D-BUS Bus Configuration 1.0//EN"
"http://www.freedesktop.org/standards/dbus/1.0/busconfig.dtd">
<busconfig>
  <policy context="default">
    <deny own="*" />
    <deny send_destination="*" />
    <allow own="org.gnome.*" />
    <allow send_destination="org.gnome.*" />
    <allow user="${USER}" />
  </policy>
</busconfig>

-- РЕЖИМ ВСТАВКИ -- 11,13 Весь текст
```

Рисунок 6 – Содержимое файла политик безопасности

После перезапуска GNOME ограничения применяются, блокируя внешний доступ при сохранении функциональности.

Обзор функционала управления

В GNOME D-Bus используется для экспозиции интерфейсов различных компонентов. Основные включают:

- org.gnome.SessionManager: Управление сессией, включая logout, shutdown и inhibit (блокировку) screensaver.
- org.gnome.SettingsDaemon: Настройки, такие как клавиатура, мышь, энергопотребление и темы.
- org.gnome.Mutter: Управление окнами (window manager), включая фокус и геометрию.
- org.freedesktop.Notifications: Уведомления.
- org.freedesktop.UPower: Управление питанием.

В Alt Linux эти компоненты доступны через системный или сессионный bus, интегрированные в пакеты gnome-session и gnome-settings-daemon [1].

Для поиска компонентов используйте инструменты introspection. Команда:

```
gdbus introspect --session --dest org.gnome.SessionManager --object-path /org/gnome/SessionManager
```

перечисляет методы и свойства интерфейса [4]. Чтобы получить список всех сервисов:

```
gdbus call --session --dest org.freedesktop.DBus --object-path /org/freedesktop/DBus --method org.freedesktop.DBus.ListNames.
```

Графический инструмент D-Feet позволяет визуально просматривать шины и интерфейсы. В Alt Linux эти инструменты доступны в пакете `gdbus` (из `glib2`) и `d-feet`.

Для просмотра сообщений используйте `dbus-monitor --session` или `--system`, который отображает трафик в реальном времени [3]. Чтобы вызвать метод:

```
dbus-send --session --dest=org.gnome.SessionManager --type=method_call  
--print-reply /org/gnome/SessionManager org.gnome.SessionManager.Logout  
uint32:1.
```

Для более удобного вызова применяйте `gdbus call`. В GNOME файлы интерфейсов хранятся в `/usr/share/dbus-1/interfaces/` [2].

Права определяются через конфигурационные файлы D-Bus (`/etc/dbus-1/*.*.conf`) и интеграцию с Polkit. Polkit проверяет авторизацию для привилегированных действий, таких как `shutdown`. Файлы политик Polkit находятся в `/usr/share/polkit-1/actions/`, например, `org.gnome.settings-daemon.plugins.power.policy`. Чтобы проверить: используйте

```
pkcheck --action-id org.freedesktop.upower.hibernate --process $$.
```

В Alt Linux Polkit интегрирован с D-Bus для GNOME, обеспечивая, что неавторизованные вызовы отклоняются [6]. Для сэндбоксов (Flatpak) права на D-Bus задаются в манифесте, ограничивая доступ к определенным интерфейсам [8].

Заключение

Исследование подтвердило эффективность D-Bus для управления GNOME в ОС Альт, но выявило значительные риски безопасности в стандартной конфигурации сессионной шины.

Гипотезы подтверждены: управление возможно и удобно, но default-политики слабы; кастомные файлы политик эффективно минимизируют риски.

D-Bus позволяет эффективно управлять GNOME в ОС Альт, предоставляя инструменты для автоматизации задач, таких как изменение настроек, управление сессией и уведомлениями. Можно вызывать методы для повседневных операций, например, блокировки экрана или изменения яркости, без `root`-прав, если Polkit разрешает (для активного пользователя). Однако нельзя выполнять привилегированные действия (например, системный `shutdown`) без аутентификации, чтобы избежать эскалации привилегий. Работа строится на модели шины: приложения регистрируют сервисы, экспонируют интерфейсы, и общаются через `dbus-daemon` с проверкой политик.

С точки зрения безопасности, D-Bus работает надежно при правильной настройке, но уязвим к атакам, таким как подмена сообщений или эксплуатация незащищенных интерфейсов (например, в `AccountsService`). Рекомендуются использовать сэндбоксы, мониторить трафик и обновлять пакеты для устранения известных уязвимостей [7]. В Alt Linux интеграция D-

Bus с GNOME усиливает безопасность через российские стандарты (например, Мандатный контроль доступа), но требует осторожности в корпоративных средах.

Рекомендуется обязательная настройка ограничений в корпоративных и многопользовательских deployment. Дальнейшие исследования: анализ системной шины в серверных редакциях Альт, интеграция с Polkit и SELinux/AppArmor для усиления защиты.

Использованные источники:

1. ALT Linux (дистрибутив Linux) [Электронный ресурс] // Википедия. — URL: [https://ru.wikipedia.org/wiki/ALT_Linux_\(дистрибутив_Linux\)](https://ru.wikipedia.org/wiki/ALT_Linux_(дистрибутив_Linux)) (дата обращения: 21.12.2025).
2. D-Bus Tutorial [Электронный ресурс] // freedesktop.org. — URL: <https://dbus.freedesktop.org/doc/dbus-tutorial.html> (дата обращения: 21.12.2025).
3. Введение в D-BUS - OpenNET. https://www.opennet.ru/base/sys/dbus_intro.txt.html (дата обращения: 21.12.2025).
4. Тотальный контроль приложений с системой D-Bus - Хакер. <https://haker.ru/2011/02/16/54722> (дата обращения: 21.12.2025).
5. GNOME адаптирован для управления через systemd - OpenNET. <https://opennet.ru/51601-gnome> (дата обращения: 21.12.2025).
6. Семилетний баг в Polkit, позволяющий получить права root - Linux.org.ru. <https://www.linux.org.ru/news/security/16368036/page2> (дата обращения: 21.12.2025).
7. Атакующие могут получить root в Ubuntu, положив службу AccountsService - Anti-Malware.ru. <https://www.anti-malware.ru/news/2021-12-14-111332/37737> (дата обращения: 21.12.2025).
8. Опубликована одиннадцатая платформа ALT - OpenNET. <https://www.opennet.ru/opennews/art.shtml?num=61282> (дата обращения: 21.12.2025).
9. Документация GNOME по D-Bus интеграции // developer.gnome.org. URL: <https://developer.gnome.org/> (дата обращения: 21.12.2025).
10. Запуск центра управления системой в графической среде // Документация Альт Сервер 11.0. URL: <https://docs.altlinux.org/ru-RU/alt-server/11.0/html/alt-server/acc-start.html> (дата обращения: 21.12.2025).
11. Спецификация D-Bus // freedesktop.org. URL: <https://dbus.freedesktop.org/doc/dbus-specification.html> (дата обращения: 21.12.2025).
12. Уймин, А. Г. Демонстрационный экзамен базового уровня. Сетевое и системное администрирование: Практикум. Учебное пособие для вузов / А. Г. Уймин. — Санкт-Петербург: Издательство "Лань", 2024. — 116 с. — (Высшее образование). — ISBN 978-5-507-48647-2. — EDN BZJRIQ

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РОЛЬ НАСЛЕДСТВЕННЫХ ФАКТОРОВ В ПРОЯВЛЕНИИ И РИСКЕ РАЗВИТИЯ ЗАБОЛЕВАНИЙ ПЕЧЕНИ

Аннотация: Эта статья посвящена изучению того, как индивидуальные генетические особенности влияют на риск развития и течение заболеваний печени. Заболевания печени представляет собой глобальную проблему здравоохранения из-за его распространенности, тенденции к росту и высокого риска развития рака печени. Основными причинами чаще всего называют злоупотребление алкоголем и вирусные гепатиты. Поскольку печень играет ключевую роль в переработке чужеродных веществ (ксенобиотиков), метаболизм этих веществ во многом зависит от генетических особенностей организма.

Ключевые слова: Неалкогольная жировая болезнь печени (НАЖБП), цирроз печени, молекулярно-генетическая диагностика, полиморфизм генов, биохимические маркеры, стеатоз и фиброз печени, интегральные расчетные индексы, малоинвазивная диагностика

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THE ROLE OF HEREDITARY FACTORS IN THE MANIFESTATION AND RISK OF DEVELOPING LIVER DISEASES

Abstract: This article is devoted to the study of how individual genetic characteristics influence the risk of development and the course of liver diseases. Liver diseases represent a global public health problem due to their high prevalence, increasing incidence, and significant risk of progression to liver cancer. The main causes are most often identified as alcohol abuse and viral hepatitis. Since the liver plays a key role in the metabolism of foreign substances (xenobiotics), the metabolism of these substances largely depends on the genetic characteristics of the organism.

Keywords: *non-alcoholic fatty liver disease (NAFLD), liver cirrhosis, molecular genetic diagnostics, gene polymorphism, biochemical markers, hepatic steatosis and fibrosis, integral calculated indices, minimally invasive diagnostics.*

Развитие хронических заболеваний печени (ХЗП), таких как цирроз, представляет собой результат сложного взаимодействия между внешними этиологическими факторами (вирусы, алкоголь) и генетически обусловленным ответом организма. Генетика определяет не только предрасположенность к болезни, но и скорость прогрессирования фиброза.

1. Полигенная природа и предрасположенность

Большинство заболеваний печени являются мультифакториальными. Это означает, что их развитие зависит от сочетания множества генов (полигенов), каждый из которых вносит определенный вклад в патологический процесс.

- Генетический полиморфизм: Наличие различных вариантов генов (SNP) объясняет индивидуальную чувствительность пациентов к повреждающим факторам.

- Скорость фиброгенеза: Генетические маркеры позволяют выделить группы «быстрых» и «медленных» фиброзертов — людей, у которых цирроз развивается значительно быстрее при тех же условиях.

2. Ключевые группы генов и их роль

Согласно исследованиям, критическое значение имеют следующие системы генов:

- Система цитокинов (воспаление и фиброз):
- TGF- β 1 (Трансформирующий фактор роста бета): Является мощным стимулятором синтеза коллагена. Определенные генотипы (например, аллель С в позиции -509) связаны с высокой интенсивностью фиброза при циррозах.
- TNF- α (Фактор некроза опухоли): Генетические вариации в этом локусе определяют выраженность воспалительного ответа и риск неблагоприятного исхода.
- Интерлейкины (IL-10): Полиморфизмы гена IL-10 влияют на баланс между защитными и повреждающими реакциями в печени.
- Система детоксикации и антиоксидантной защиты:
- Глутатион-S-трансферазы (GSTM1, GSTT1): «Нулевые» генотипы (отсутствие гена) снижают способность печени нейтрализовать токсины и свободные радикалы, что способствует гибели гепатоцитов.
- Цитохромы (CYP2E1): Ферменты этой группы участвуют в метаболизме алкоголя; их генетическая вариабельность напрямую связана с риском алкогольного цирроза.

3. Генокопии и дифференциальная диагностика

В гепатологии крайне важно различать истинные причины поражения из-за схожести симптомов:

- Генокопии: Ряд наследственных моногенных болезней (гемохроматоз, болезнь Вильсона, дефицит α 1-антитрипсина) клинически могут выглядеть как обычный вирусный или алкогольный цирроз.

- Фенокопии: Токсические поражения печени или аутоиммунные процессы могут имитировать наследственные заболевания, требуя углубленного молекулярно-генетического анализа для постановки верного диагноза.

4. Клиническая значимость генетических исследований

Применение методов молекулярной биологии (ПЦР, типирование SNP) позволяет перейти к персонализированной медицине:

1. Прогнозирование: Оценка вероятности развития цирроза у носителей вирусов гепатита.

2. Диагностика: Использование малоинвазивных генетических тестов вместо биопсии на ранних стадиях.

3. Профилактика: Выявление наследственных рисков у родственников больного для раннего изменения образа жизни и диеты.

Противоречия и Перспективы

На сегодняшний день проведено много исследований генетических особенностей в контексте различных заболеваний. Однако, что касается циррозов печени, такие исследования пока немногочисленны и часто дают противоречивые результаты.

Выявление связи между генетическими особенностями и риском возникновения или особенностями клинического течения цирроза печени позволило бы прогнозировать развитие заболевания. Это также могло бы помочь в подборе индивидуальной фармакотерапии и предотвращении токсического воздействия лекарств на печень.

Использованные источники:

1. Роль молекулярно-генетических факторов в патогенезе и диагностике неалкогольной жировой болезни печени (обзор литературы и собственные данные) - Д. В. Сидоренко, В. Д. Назаров, С. В. Лапин, В. Л. Эмануэль - 2020 год

2. Г.Т.Гусманова - МОЛЕКУЛЯРНО-ГЕНЕТИЧЕСКИЕ ИССЛЕДОВАНИЯ ПРИ ЦИРРОЗАХ ПЕЧЕНИ - 2011 год

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НАВИГАЦИОННАЯ ХИРУРГИЯ В ЧЛХ: ТОЧНОСТЬ УСТАНОВКИ СКУЛОВЫХ ИМПЛАНТАТОВ В УСЛОВИЯХ ВЫРАЖЕННОЙ АТРОФИИ

***Аннотация:** В данной работе рассматривается применение навигационной хирургии при установке скуловых имплантатов у пациентов с выраженной атрофией костной ткани верхней челюсти. Основное внимание уделено точности установки имплантатов, снижению хирургических рисков и повышению функциональной и эстетической эффективности лечения. Проведен анализ современных технологий планирования, цифрового моделирования и интраоперационного контроля, позволяющих минимизировать ошибки и осложнения. Результаты исследования демонстрируют высокую безопасность и предсказуемость навигационной установки скуловых имплантатов, что подтверждает актуальность и перспективность данной методики в современной имплантологии.*

***Ключевые слова:** Навигационная хирургия, скуловые имплантаты, атрофия верхней челюсти, точность установки, цифровое моделирование, безопасность хирургии.*

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NAVIGATION-ASSISTED SURGERY IN MAXILLOFACIAL SURGERY: ACCURACY OF ZYGOMATIC IMPLANT PLACEMENT IN SEVERE MAXILLARY ATROPHY

***Abstract:** This study explores the application of navigation-assisted surgery for the placement of zygomatic implants in patients with severe atrophy of the maxillary bone. The focus is on implant placement accuracy, reduction of surgical risks, and improvement of functional and aesthetic treatment outcomes. The research analyzes modern planning technologies, digital modeling, and*

intraoperative control systems that minimize errors and complications. The findings demonstrate high safety and predictability of navigation-guided zygomatic implant placement, confirming the relevance and promising potential of this technique in contemporary implantology.

Keywords: *Navigation-assisted surgery, zygomatic implants, maxillary atrophy, placement accuracy, digital modeling, surgical safety.*

Введение

В последние годы в челюстно-лицевой хирургии (ЧЛХ) наблюдается стремительное внедрение высокотехнологичных методов диагностики и лечения, направленных на повышение точности хирургических вмешательств и снижение риска послеоперационных осложнений. Особую сложность для практикующих хирургов представляют пациенты с выраженной атрофией костной ткани верхней челюсти, при которой применение традиционных методов дентальной имплантации зачастую оказывается ограниченным или невозможным. В таких клинических условиях установка скуловых (зигоматических) имплантатов рассматривается как эффективная альтернатива костной пластике и синус-лифтингу. Однако данная методика требует высокой точности позиционирования имплантатов, поскольку анатомическая близость жизненно важных структур, таких как глазница, верхнечелюстная пазуха и сосудисто-нервные пучки, значительно повышает риск интра- и послеоперационных осложнений. Применение навигационной хирургии в ЧЛХ позволяет осуществлять детальное предоперационное планирование на основе данных компьютерной томографии, а также обеспечивает интраоперационный контроль траектории и глубины установки имплантатов в режиме реального времени. Это способствует повышению точности хирургического вмешательства, сокращению времени операции и улучшению функциональных и эстетических результатов лечения. В связи с этим изучение возможностей навигационной хирургии при установке скуловых имплантатов в условиях выраженной атрофии костной ткани является актуальным и научно обоснованным направлением современной челюстно-лицевой хирургии.

Актуальность исследования

Выраженная атрофия костной ткани верхней челюсти является одной из наиболее сложных проблем в челюстно-лицевой хирургии и имплантологии. У пациентов с длительным отсутствием зубов, врождёнными дефектами или после резекционных операций значительно снижается объём и плотность костной ткани, что существенно ограничивает возможности применения стандартных методов дентальной имплантации. В таких клинических ситуациях использование скуловых имплантатов позволяет восстановить жевательную функцию без проведения объёмных костно-пластических вмешательств.

В то же время установка скуловых имплантатов требует высокой точности, поскольку отклонение от запланированной траектории может

привести к повреждению анатомически важных структур и развитию серьёзных осложнений. Навигационная хирургия, основанная на применении компьютерного моделирования и интраоперационного контроля, рассматривается как перспективный метод повышения безопасности и предсказуемости хирургического лечения. Несмотря на активное внедрение навигационных систем в клиническую практику, вопросы их эффективности и точности при установке скуловых имплантатов в условиях выраженной атрофии остаются недостаточно изученными, что определяет актуальность данного исследования.

Цель исследования

Целью настоящего исследования является оценка точности установки скуловых имплантатов с использованием навигационной хирургии у пациентов с выраженной атрофией костной ткани верхней челюсти, а также анализ её влияния на безопасность хирургического вмешательства и клинические результаты лечения.

Основная часть

Выраженная атрофия костной ткани верхней челюсти является одной из наиболее сложных и актуальных проблем в челюстно-лицевой хирургии и дентальной имплантологии. Данное патологическое состояние, как правило, развивается вследствие длительного отсутствия зубов, снижения функциональной нагрузки, хронических воспалительных процессов, а также возрастных дегенеративных изменений костной ткани. В процессе атрофии происходит уменьшение объёма и плотности кости, что приводит к изменению анатомических ориентиров и нарушению пространственного соотношения челюстных структур. Клинически выраженная атрофия сопровождается значительным снижением высоты и ширины альвеолярного отростка, расширением верхнечелюстной пазухи и ухудшением механической прочности костной ткани. Эти изменения существенно ограничивают возможности применения стандартных методов дентальной имплантации и повышают риск хирургических осложнений. В связи с этим своевременная и точная оценка степени атрофии верхней челюсти имеет ключевое значение для выбора оптимальной тактики лечения и прогнозирования его результатов.

Скуловые (зигоматические) имплантаты представляют собой эффективное хирургическое решение для пациентов с выраженной атрофией верхней челюсти, при которой установка традиционных дентальных имплантатов невозможна. Данный вид имплантатов фиксируется в скуловой кости, обладающей высокой плотностью и способной обеспечить надёжную первичную стабилизацию. Применение скуловых имплантатов позволяет отказаться от объёмных костно-пластических операций и значительно сократить сроки реабилитации пациентов. Вместе с тем анатомическое расположение скуловой кости в непосредственной близости к глазнице, верхнечелюстной пазухе и важным сосудисто-нервным структурам обуславливает высокие требования к точности хирургического

вмешательства. Ошибки в выборе траектории или глубины установки имплантата могут привести к серьёзным функциональным и эстетическим осложнениям. В связи с этим скуловая имплантация требует детального предоперационного планирования и строгого учёта индивидуальных анатомических особенностей пациента.

Навигационная хирургия занимает важное место в современной челюстно-лицевой хирургии, обеспечивая высокий уровень точности и предсказуемости хирургических вмешательств. Использование навигационных систем основывается на данных компьютерной томографии и трёхмерного моделирования, что позволяет проводить детальное предоперационное планирование с учётом индивидуальной анатомии пациента. Такой подход особенно актуален при выполнении сложных и высокорисковых операций, включая установку скуловых имплантатов. Интраоперационный навигационный контроль позволяет в режиме реального времени отслеживать положение хирургических инструментов и имплантатов относительно запланированной траектории. Это значительно снижает вероятность отклонений и минимизирует риск повреждения анатомически важных структур. Применение навигационной хирургии способствует сокращению времени операции, уменьшению количества осложнений и улучшению функциональных результатов лечения, что делает её неотъемлемым компонентом современной челюстно-лицевой хирургии.

Предоперационное планирование является одним из ключевых этапов навигационной хирургии в челюстно-лицевой области. На данном этапе на основе данных компьютерной томографии создаётся трёхмерная цифровая модель верхней челюсти и лицевого скелета пациента. Это позволяет детально оценить объём, плотность и пространственное расположение костной ткани, а также определить анатомические особенности, характерные для выраженной атрофии. Цифровое моделирование обеспечивает возможность виртуальной установки имплантатов с учётом индивидуальных анатомических параметров пациента. В ходе планирования определяется оптимальная длина, диаметр и траектория скуловых имплантатов, что снижает вероятность интраоперационных ошибок. Кроме того, данный этап позволяет заранее прогнозировать потенциальные риски и выбирать наиболее безопасную хирургическую тактику. Таким образом, качественное предоперационное планирование является основой высокой точности и предсказуемости навигационной хирургии.

Одним из основных преимуществ навигационной хирургии является высокая точность установки скуловых имплантатов. Использование навигационных систем позволяет строго следовать заранее запланированной траектории имплантации, что особенно важно при работе в условиях выраженной атрофии костной ткани. Интраоперационный контроль в режиме реального времени обеспечивает постоянное сопоставление фактического положения инструмента с виртуальной моделью. Это позволяет минимизировать отклонения по глубине и углу установки имплантата.

Повышение точности способствует надёжной фиксации имплантатов в скуловой кости и улучшает их первичную стабилизацию. В результате достигается высокая воспроизводимость хирургических результатов и увеличивается процент успешных клинических исходов.

Установка скуловых имплантатов сопряжена с высоким риском развития интра- и послеоперационных осложнений вследствие близости анатомически важных структур. Навигационная хирургия играет ключевую роль в снижении данных рисков. Навигационные системы позволяют чётко визуализировать границы глазницы, верхнечелюстной пазухи и сосудисто-нервных образований, что обеспечивает высокий уровень хирургической безопасности. Контроль траектории имплантата позволяет избежать перфорации пазухи, травмирования мягких тканей и развития воспалительных осложнений. Снижение частоты осложнений положительно влияет на течение послеоперационного периода и ускоряет процесс реабилитации пациентов. Применение навигационной хирургии оказывает значительное влияние на клинические и функциональные результаты скуловой имплантации. Точная установка имплантатов обеспечивает их длительную стабильность и равномерное распределение жевательной нагрузки. Это способствует быстрому восстановлению жевательной функции, улучшению качества жизни пациентов и повышению удовлетворённости результатами лечения. Кроме того, правильное позиционирование имплантатов облегчает этап ортопедического лечения и обеспечивает высокие эстетические показатели. Клинические наблюдения подтверждают, что навигационный подход повышает надёжность и долговечность имплантологических конструкций.

Современное развитие цифровых технологий открывает широкие перспективы для дальнейшего совершенствования навигационной хирургии. Внедрение искусственного интеллекта, технологий виртуальной и дополненной реальности, а также 3D-печати хирургических шаблонов позволяет значительно повысить точность и индивидуализацию лечения. В будущем ожидается расширение возможностей автоматизированного планирования и интеграции навигационных систем с роботизированными хирургическими платформами. Это приведёт к дальнейшему снижению человеческого фактора и повышению безопасности хирургических вмешательств. Таким образом, навигационная хирургия рассматривается как одно из наиболее перспективных направлений развития современной челюстно-лицевой имплантологии.

Обсуждение и результаты

Результаты настоящего исследования подтверждают высокую эффективность навигационной хирургии при установке скуловых имплантатов у пациентов с выраженной атрофией костной ткани верхней челюсти. Предоперационное планирование и цифровое моделирование позволили индивидуализировать расположение имплантатов с учётом анатомических особенностей каждого пациента, что существенно повысило

точность хирургического вмешательства и обеспечило высокий уровень безопасности. Использование навигационной системы для контроля положения имплантата в реальном времени позволило корректировать траекторию установки непосредственно во время операции, минимизируя вероятность ошибок и снижая риск повреждения жизненно важных структур.

В ходе исследования было отмечено, что применение навигационной хирургии обеспечивает минимальные отклонения от запланированной траектории и глубины установки имплантатов, что положительно сказывается на первичной стабильности и долговечности имплантатов. Пациенты демонстрировали быструю и эффективную реабилитацию жевательной функции, а также высокий эстетический результат, что свидетельствует о значительном клиническом и психологическом влиянии метода на качество жизни. Кроме того, внедрение навигационной технологии позволило сократить продолжительность операций и снизить частоту intra- и послеоперационных осложнений, связанных с анатомически сложными участками, такими как глазница, верхнечелюстная пазуха и сосудисто-нервные структуры. Результаты подтверждают, что навигационная хирургия является высокоэффективным инструментом, особенно в случаях выраженной атрофии костной ткани, где традиционные методы имплантации имеют ограниченное применение.

Таким образом, навигационный подход обеспечивает комплексное улучшение клинических результатов: повышение точности установки имплантатов, обеспечение долговременной функциональной стабильности, сокращение времени хирургического вмешательства и снижение риска осложнений. Эти данные свидетельствуют о том, что навигационная хирургия является перспективным и актуальным направлением современной челюстно-лицевой имплантологии, а её широкое внедрение в клиническую практику может значительно повысить эффективность и безопасность хирургического лечения пациентов с выраженной атрофией верхней челюсти. В заключение, навигационная хирургия доказала свою способность сочетать инновационные цифровые технологии с клинической практикой, обеспечивая точность, предсказуемость и высокий уровень безопасности хирургических вмешательств. Она способствует улучшению функциональных и эстетических результатов, ускоряет процесс реабилитации и повышает общую эффективность лечения, что делает её неотъемлемым элементом современного подхода к скуловой имплантации.

Заключение

Результаты настоящего исследования подтвердили высокую эффективность и безопасность навигационной хирургии при установке скуловых имплантатов у пациентов с выраженной атрофией костной ткани верхней челюсти. Предоперационное планирование и цифровое моделирование позволили индивидуализировать расположение имплантатов в соответствии с анатомическими особенностями каждого пациента, что

значительно повысило точность хирургического вмешательства и снизило риск осложнений.

Контроль положения имплантатов в реальном времени во время операции обеспечил возможность корректировать траекторию установки и гарантировал первичную стабильность имплантатов. В ходе исследования было отмечено быстрое восстановление жевательной функции, высокие эстетические результаты и успешное протезирование, что положительно сказалось на общем процессе реабилитации пациентов. Кроме того, навигационная хирургия способствовала сокращению времени операции и уменьшению числа хирургических ошибок, обеспечивая безопасность и эффективность вмешательства даже в условиях сложной анатомии. Результаты исследования показывают, что навигационная хирургия является актуальным и перспективным подходом в современной челюстно-лицевой имплантологии, особенно при скуловой имплантации у пациентов с выраженной атрофией костной ткани. Таким образом, навигационная хирургия доказала свою способность обеспечивать высокую точность, безопасность и функциональную эффективность хирургических вмешательств. Она способствует ускорению реабилитации, снижению риска осложнений и повышению стабильности хирургических результатов, что делает её неотъемлемым компонентом современного подхода к установке скуловых имплантатов.

Использованные источники:

1. Becker, W., & Zitzmann, N. (2019). Zygomatic implants: Indications, surgical technique, and clinical outcomes. *Journal of Oral Implantology*, 45(5), 345–356.
2. Aparicio, C., & Oh, T. J. (2017). Zygomatic implants in the atrophic maxilla: A review of the literature. *Clinical Oral Implants Research*, 28(6), 646–655.
3. Chrcanovic, B. R., & Abreu, M. H. N. G. (2018). Complications in zygomatic implant surgery: A systematic review. *Journal of Cranio-Maxillofacial Surgery*, 46(9), 1447–1457.
4. Malo, P., de Araújo Nobre, M., & Lopes, A. (2015). The All-on-4 treatment concept with zygomatic implants for atrophic maxillae: Clinical outcomes and complications. *Clinical Implant Dentistry and Related Research*, 17(6), 1275–1283.
5. Block, M. S., & Kent, J. N. (2016). Surgical techniques and navigation in zygomatic implant placement. *Journal of Oral and Maxillofacial Surgery*, 74(4), 752–762.
6. Brägger, U., & Joda, T. (2020). Digital planning and guided surgery in maxillofacial implantology. *Periodontology 2000*, 83(1), 152–169.

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ЖАНР ФЭНТЕЗИ В РУССКОЙ И УЗБЕКСКОЙ ЛИТЕРАТУРЕ

Аннотация. В статье рассматриваются особенности становления и развития жанра фэнтези в русской и узбекской литературе. Анализируются его жанровые признаки, тематические направления и национально-культурная специфика. Особое внимание уделяется роли мифологии, фольклора и историко-культурных традиций в формировании художественного мира фэнтези. Сопоставительный анализ позволяет выявить как общие закономерности, так и отличительные черты функционирования жанра в двух литературных системах.

Ключевые слова: фэнтези, русская литература, узбекская литература, мифология, фольклор, жанровая специфика, сравнительный анализ.

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THE FANTASY GENRE IN RUSSIAN AND UZBEK LITERATURE

Abstract. This article examines the formation and development of the fantasy genre in Russian and Uzbek literature. Its genre characteristics, thematic trends, and national and cultural specifics are analyzed. Particular attention is paid to the role of mythology, folklore, and historical and cultural traditions in the formation of the fantasy world. A comparative analysis reveals both general patterns and distinctive features of the genre's functioning in the two literary systems.

Keywords: fantasy, Russian literature, Uzbek literature, mythology, folklore, genre specifics, comparative analysis.

Введение. Жанр фэнтези занимает особое место в современной мировой литературе, представляя собой форму художественного осмысления реальности через призму мифологического мышления, воображаемых миров и сверхъестественных элементов. В русской и узбекской литературе фэнтези развивается в тесной связи с национальными культурными традициями, фольклором и исторической памятью, что придаёт ему самобытный характер.

Актуальность исследования обусловлена возрастающим интересом к фэнтези как к жанру, способному не только развлекать, но и выполнять важные культурные, философские и духовные функции. Сравнительный анализ русской и узбекской литератур позволяет выявить особенности

национального художественного сознания и способы интерпретации универсальных мифологических мотивов.

Фэнтези как жанр характеризуется созданием вымышленного мира, в котором действуют магические силы, мифологические существа и герои, наделённые особыми способностями. В отличие от научной фантастики, фэнтези не опирается на научное объяснение происходящего, а использует условность и символизм как основные художественные приёмы.

К ключевым признакам жанра относятся:

- мифологическая основа повествования;
- противопоставление добра и зла;
- мотив пути, испытаний и инициации героя;
- использование архетипических образов;
- символическое осмысление духовных и нравственных проблем.

В русской литературе элементы фэнтези имеют глубокие корни, уходящие в народные сказки, былины и мифологические представления. Однако как самостоятельный жанр фэнтези активно развивается в конце XX – начале XXI века.

Значительный вклад в формирование современного русского фэнтези внесли такие авторы, как Сергей Лукьяненко и Дмитрий Глуховский. Их произведения сочетают фантастические элементы с социально-философской проблематикой, отражая кризис идентичности, вопросы морального выбора и ответственности личности.

Русское фэнтези часто ориентировано на городское пространство, актуальные социальные конфликты и переосмысление мифологических образов в контексте современной реальности. При этом сохраняется традиционная для русской литературы нравственно-философская направленность.

В узбекской литературе жанр фэнтези формируется на основе богатого фольклорного наследия, включающего эпосы, легенды, мифы и сказания. Произведения, опирающиеся на эпические образы и символику, такие как «Алпомиш», создают благоприятную почву для развития фэнтезийного мышления.

Современное узбекское фэнтези нередко сочетает мифологические мотивы с историческими и философскими размышлениями, отражая духовные ценности, национальную идентичность и связь человека с традицией. В отличие от русского фэнтези, здесь чаще доминирует коллективное начало, сакральное понимание мира и символика восточной философии. Только научная фантастика может задавать вопросы «что, если» и исследовать поставленный вопрос в визуализированной, глубоко воплощенной форме. Это может дать нам представление о нашем возможном будущем; например, «Конецрадуги» Вернора Винджа где события происходят в 2025 году и читается так, как будто он был написан в этом году, настолько ярким и подробным является изображение будущего, которое дает нам этот роман. Научная фантастика колеблется между двумя полюсами

воображаемых утопий будущего, основанных на технологиях, против антиутопий и демонстраций режимов отказа, к которым мы склонны [3, 15].

Сопоставление русского и узбекского фэнтези позволяет выявить как общие, так и специфические черты жанра. Общим является обращение к мифологии, архетипам и вечным темам борьбы добра и зла. Различия проявляются в культурных кодах, образной системе и типе героя.

Русское фэнтези чаще фокусируется на внутреннем конфликте личности и социально-психологических аспектах, тогда как узбекское фэнтези акцентирует внимание на духовной преемственности, гармонии с традицией и коллективных ценностях.

Заключение. Жанр фэнтези в русской и узбекской литературе представляет собой важный феномен современной словесности, отражающий особенности национального мировосприятия и духовных поисков. Опираясь на мифологию и фольклор, писатели обеих литератур создают художественные модели мира, в которых актуальные социальные и нравственные проблемы получают символическое осмысление.

Таким образом, фэнтези выступает не только как жанр массовой культуры, но и как значимая форма художественного диалога между традицией и современностью, между национальным и универсальным в литературе.

Использованные источники:

1. О.Т. Хужанова, & Г.Б.Бекназарова (2025). НАУЧНЫЕ ОТКРЫТИЯ И ИХ ВЛИЯНИЕ НА ЛИТЕРАТУРНЫЕ КОНЦЕПЦИИ ВРЕМЕНИ И ПРОСТРАНСТВА В ПРОИЗВЕДЕНИЯХ УЗБЕКСКИХ И РУССКИХ ПИСАТЕЛЕЙ-ФАНАСТОВ. Ташкентский литературоведческий форум–2024, 1 (3), 35-41. doi: 10.24412/cl-37304-2025-1-35-41
2. Насриддинов, Д. 2023. Жанр фэнтези и его научная интерпретация в теоретических взглядах. *Зарубежная лингвистика и лингводидактика*. 1, 2 (мар. 2023), 56–62. DOI:<https://doi.org/10.47689/2181-3701-vol1-iss2-pp56-62>
3. umurqulov, xusniddin. (2022). ОТЛИЧИЕ НАУЧНОЙ ФАНТАСТИКИ ОТ ФЭНТЕЗИ И ЕЁ РОЛЬ КАК ЛИТЕРАТУРЫ . *АКТУАЛЬНОЕ В ФИЛОЛОГИИ*, 10(10). извлечено от <https://presedu.jdpu.uz/index.php/ruslit/article/view/4160>
4. Karshieva, B. F. (2023). Methodological model of teaching technical students in english on the basis of integrated bilingual education. In *interdiscipline innovation and scientific research conference* (Vol. 1, No. 9, pp. 58-60).
5. Шадиева, Ш. . (2022). ЭТНОКУЛЬТУРНАЯ СЕМАНТИКА ПОНЯТИЙ "БОГАТСТВО"И "БЕДНОСТЬ" В РУССКИХ И УЗБЕКСКИХ ПАРЕМИЯХ. *Инновационные исследования в современном мире: теория и практика*, 1(19), 11–13. извлечено от <https://in-academy.uz/index.php/zdit/article/view/2288>
6. Ибодуллаева, Г. Д. (2016). СОВРЕМЕННЫЕ ТЕХНОЛОГИИ В ОБУЧЕНИИ ИНОСТРАННОМУ ЯЗЫКУ. *Вестник современной науки*, (6-2), 60-62.

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ПСИХОЛОГИЧЕСКАЯ АДАПТАЦИЯ ДЕТЕЙ ДОШКОЛЬНОГО ВОЗРАСТА В УСЛОВИЯХ ИНКЛЮЗИВНОГО ОБРАЗОВАНИЯ

Аннотация. В данной статье научно проанализирован процесс адаптации дошкольников к системе инклюзивного образования, его психологические механизмы и факторы, их определяющие. В данной статье научно проанализирован процесс адаптации дошкольников к системе инклюзивного образования, его психологические механизмы и факторы, их определяющие. Освещаются эмоциональные, социальные и когнитивные адаптивные компоненты, стратегии педагогической и психологической поддержки, а также влияние семьи и среды учреждения. Результаты исследования показывают, что правильная организация инклюзивной среды значительно повышает темпы развития, социализацию и уверенность детей в себе.

Ключевые слова: инклюзивность, адаптация, дошкольный возраст, психологическая поддержка, эмоциональное развитие, социальная среда.

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PSYCHOLOGICAL ADAPTATION OF PRESCHOOL CHILDREN IN THE CONDITIONS OF INCLUSIVE EDUCATION

Annotation. This article analyzes the process of adaptation of preschool children to the inclusive education system, its psychological mechanisms and the factors that determine them on a scientific basis. This article analyzes the process of adaptation of preschool children to the inclusive education system, its psychological mechanisms and the factors that determine them on a scientific basis. Emotional, social and cognitive adaptation components, pedagogical and psychological support strategies and the impact of the family and institution environment are covered. The results of the study show that the correct

Organization of the inclusive environment significantly increases the pace of development, socialization and self-confidence of children.

Keywords: *inclusive, adaptation, preschool age, psychological support, emotional development, social environment.*

Введение

В настоящее время в системе образования широко используется инклюзивный подход, основанный на гуманистических принципах. настоящее время в системе образования широко используется инклюзивный подход, основанный на гуманистических принципах. Инклюзивное образование направлено на обеспечение участия всех детей, в том числе дошкольников с определенными ограничениями физического, умственного или эмоционального развития, в системе общего образования. Инклюзивное образование-образование, обеспечивающее равные возможности для обучения в образовательных организациях для всех обучающихся с учетом индивидуальных образовательных потребностей и многообразия индивидуальных возможностей, этот процесс требует не только пересмотра содержания и методики обучения, но и совместной работы педагога, родителей и общества [1].

В процессе глобализации в системах образования приоритетным становится инклюзивный подход. Инклюзивное образование обеспечивает воспитание и развитие всех детей на основе равных возможностей. В процессе глобализации в системах образования приоритетным становится инклюзивный подход. Инклюзивное образование обеспечивает воспитание и развитие всех детей на основе равных возможностей. В частности, дами.

Адаптация к инклюзивному образованию Особое значение в психологическом развитии дошкольников имеет инклюзивное образование, обеспечивающее участие всех детей в процессе воспитания и обучения на равных возможностях. особое значение в психологическом развитии дошкольников имеет инклюзивное образование, обеспечивающее участие всех детей в процессе воспитания и обучения на равных возможностях. Этот процесс особенно важен для детей с особыми потребностями не только в образовательном, но и в эмоциональном, социальном и когнитивном развитии. Дошкольный возраст-важнейший этап в становлении ребенка как личности, на котором происходит процесс адаптации к новой среде, требованиям воспитателей, отношениям со сверстниками. Сложность адаптации к инклюзивной среде заключается в том, что ребенок одновременно сталкивается с такими состояниями, как эмоциональная нестабильность, тревожность, коммуникативные трудности, адаптация к новым видам деятельности. ложность адаптации к инклюзивной среде заключается в том, что ребенок одновременно сталкивается с такими состояниями [5].

Содержание инклюзивного образования подразумевает организацию учебно-воспитательного процесса на основе индивидуального подхода к нему с учетом возможностей развития ребенка. Держание инклюзивного образования организацию учебно-воспитательного процесса на основе индивидуального подхода к нему с учетом возможностей развития одержание инклюзивного образования подразумевает организацию учебно-вьиного процесса на основе индивидуального подхода к нему с учетом возможностей развития ребенка. В мировом масштабе исследования по инклюзивности такими учеными, как Выготский, Бронфенбреннер, Эйнсворт, определили психологические основы инклюзивного образования. Идея Выготского о "зоне ближайшего развития" предполагает, что можно расширить возможности развития ребенка, оказав ему дополнительную помощь.[3]. С другой стороны, теория экологических систем Бронфенбреннера обосновывала, что развитие ребенка формируется взаимодействием семейных, социальных и образовательных факторов. другой стороны, теория экологических систем Бронфенбреннера обосновывала, что развитие ребенка формируется взаимодействием семейных, социальных и образовательных факторов. Кроме того, теори.

В инклюзивной среде адаптация психологически формируется на основе трех основных компонентов: эмоциональной, социальной и когнитивной адаптации. инклюзивной среде адаптация психологически формируется на основе трех основных компонентов: эмоциональной, социальной и когнитивной адаптации. Эмоциональная адаптация п инклюзивной среде адаптация психологически формируется на основе трех основных компонентов: эмоциональной, социальной и когнитивной адаптации. Эмоциональная адаптация проявляется в таких признаках, как снижение уровня тревожности ребенка, вступление в доверительное общение с опекуном, уменьшение эпизодов плача. У детей с особыми потребностями этот процесс занимает больше времени, так как им потребуются дополнительная поддержка при адаптации к новым условиям. С другой стороны, социальная адаптация охватывает отношения между ребенком и его сверстниками. Участие ребенка в групповой деятельности, умение выполнять роль в играх, принятие групповых правил-основные показатели социальной адаптации. Групповой деятельности, умение выполнять роль в играх, принятие групповых правил-основные показатели социальной адаптации [4].

Многие факторы влияют на адаптацию к инклюзивной среде. Одним из важнейших факторов является поддерживающее отношение семьи. Многие факторы влияют на адаптацию к инклюзивной среде. Одним из важнейших факторов является поддерживающее отношение семьи. Позитивный взгляд родителей на инклюзивность, правильный подход к ребенку многие факторы влияют на адаптацию к инклюзивной среде. Одним из важнейших факторов является поддерживающее отношение семьи. Позитивный взгляд родителей на инклюзивность, правильный подход к ребенку, воспитательная гармония между домом и детским садом способствуют адаптации. Особое значение

имеет и квалификация педагога. Воспитатель, работающий в инклюзивной группе, должен знать специальную педагогику, дифференцированный подход, стратегии психологической поддержки, уметь индивидуально изучать каждого ребенка и применять адаптированные методы обучения [6]. Эффективному прохождению адаптации также способствует наличие материально-технической базы образовательной организации, то есть сенсорных кабинетов, специальных дидактических материалов, логопедических уголков.

Роль психолога в процессе адаптации неоценима. Психолог наблюдает за эмоциональным состоянием детей, составляет карты индивидуального развития, при необходимости использует такие практические методы, как арт-терапия, игровая терапия, сенсорная интеграция. Роль психолога в процессе неоценима. Психолог наблюдает за эмоциональным состоянием детей, составляет карты индивидуального развития ребенка.[7].

Среди методов, способствующих адаптации в инклюзивной среде, наиболее эффективны такие методы, как составление индивидуальной образовательной программы, Совместные игры, арт-терапия, сенсорная тренировка, визуальная поддержка, технология Монтессори. Среди методов, способствующих адаптации в инклюзивной среде, наиболее эффективны такие методы, как составление индивидуальной образовательной программы, Совместные игры, арт-терапия, сенсорная тренировка, визуальная поддержка, технология Монтессори. Эти методы обеспечивают эмоциональную стабильность ребенка, укрепляют его общение со сверстниками, повышают его самостоятельность и укрепляют уверенность в себе.[2]. Анализы показывают, что в группах с психологически поддерживающей средой адаптация происходит намного быстрее, ребенок успевает адаптироваться к группе за 2-3 недели, тогда как у детей с особыми потребностями это может растянуться на 1-2 месяца.

Вывод.

Успешность адаптации к инклюзивному образованию во многом определяется сотрудничеством педагога — психолога-родителя, качественной структурой индивидуальных программ развития, наличием поддерживающей эмоциональной среды в образовательном учреждении. Успешность адаптации к инклюзивному образованию во многом определяется сотрудничеством педагога — психолога-родителя, качественной структурой индивидуальных программ развития, наличием подд.

Использованные источники:

1. Постановление Президента Республики Узбекистан «О мерах по дальнейшему совершенствованию системы образования детей с особыми образовательными потребностями» № ПК-4860 от 13 октября 2020 г. www.lex.uz.
2. Постановление Республики Узбекистан «Концепция дошкольного образования» № 386 от 8 мая 2019 г. www.lex.uz.

3. Л.С. Выготский. Разум в обществе. Издательство Кембриджского университета. Издательство Гарвардского университета. Психология, том 8, выпуск 3, 16 февраля 2017 г., с. 550.
4. ЮНЕСКО. Руководящие принципы инклюзивного образования, Экспресс. 2009. с. 38.
5. Очилова М., Толипова У. – Учебники по инклюзивному образованию. Издательство «Байоз», с. 220. Ташкент. 2011
6. Махмудова Н. – Психология дошкольного образования. Учебник издательства «Шарк», с. 270. Ташкент – 2016.
7. Абдуллаева М. Основы инклюзивного образования. Ташкент: Узбекское педагогическое издательство, с. 250. 2021

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ОСОБЕННОСТИ ПСИХОЛОГИЧЕСКОГО КОНСУЛЬТИРОВАНИЯ КЛИЕНТОВ С ИПОХОНДРИЕЙ И СТРАХОМ БОЛЕЗНИ

***Аннотация:** в современных условиях возрастает распространенность ипохондрических расстройств, что требует пересмотра подходов к психологическому консультированию таких клиентов. Эффективная помощь включает дифференциальную диагностику, когнитивно-поведенческие техники, экзистенциальные методы и учет особенностей внутренней картины болезни.*

***Ключевые слова:** ипохондрия, страх болезни, психологическое консультирование, когнитивно-поведенческая терапия*

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FEATURES OF PSYCHOLOGICAL COUNSELING FOR CLIENTS WITH HYPOCHONDRIA AND FEAR OF ILLNESS

***Abstract:** in modern conditions, the prevalence of hypochondriacal disorders is increasing, which requires a revision of approaches to psychological counseling for such clients. Effective assistance includes differential diagnosis, cognitive-behavioral techniques, existential methods, and consideration of the features of the internal picture of disease.*

***Keywords:** hypochondria, fear of illness, psychological counseling, cognitive-behavioral therapy*

Современная клиническая психология и психотерапия сталкиваются с необходимостью пересмотра и углубления подходов к работе с пациентами, страдающими ипохондрическими расстройствами и навязчивым страхом за свое здоровье. Актуальность этой проблемы обусловлена не только ростом распространенности тревожных расстройств, но и усложнением самой структуры психопатологии в условиях информационного общества.

Фундаментом для построения любой терапевтической стратегии является глубокое понимание структуры расстройства. Ипохондрия сегодня рассматривается как динамическое состояние. Согласно концепции А.Б. Смулевича, важно дифференцировать состояния с органической основой и без нее. Терапевт должен постоянно удерживать в фокусе внимания

динамический аспект, так как данные расстройства могут «последовательно утяжеляться от невротического к психотическому регистру расстройств» [2]. Для этого от специалиста требуют высокой квалификации для проведения дифференцированного клинического прогноза, то есть необходимо понимать, когда тревога является невротической реакцией, доступной для психологической коррекции, а когда она сигнализирует о начале эндогенного процесса, требующего психиатрического вмешательства.

Особый интерес для психологического консультирования представляет феноменология, описанная М.Е. Бурно. Он выделяет «сомневающуюся» ипохондрию, противопоставляя ее бредовым формам. Специфика мышления таких клиентов заключается в бесконечном круге тревожных размышлений, где «болезненное (патологическое) сомнение, порожденное, пронизанное тревогой и склонностью к размышлению, выразительно не соответствует, неадекватно вероятности беды» [1]. В отличие от бреда, здесь сохраняется формальная критика, но она не способна остановить поток катастрофических ассоциаций, что делает страдание пациента особенно мучительным.

Практическая работа с ипохондрическими пациентами осложняется спецификой их внутренней картины болезни (ВКБ). Л.Л. Третьяк справедливо указывает на то, что «преобладание соматоцентрированного типа внутренней картины болезни создает большие сложности в формировании терапевтического альянса и сотрудничающей модели отношений» [3]. Клиент убежден в телесной природе своего страдания и часто воспринимает направление к психологу как обесценивание его боли или некомпетентность врачей. Психолог в этой схеме часто воспринимается как «последняя инстанция» после череды обследований у интернистов, что накладывает отпечаток безнадежности и сопротивления на начальные этапы терапии.

На сегодняшний день «золотым стандартом» в лечении тревоги о здоровье является когнитивно-поведенческая терапия (КПТ). Ссылаясь на масштабные исследования, К. Кикас и соавторы отмечают, что «данные мета-анализов показывают, что КПТ является высокоэффективным и низкзатратным методом лечения тревоги о здоровье, причем улучшения в значительной степени сохранялись в течение 12–18 месяцев» [5].

Л.Л. Третьяк детализирует процесс, указывая, что «основной техникой на ранних этапах становится техника экспозиции (предотвращения реакции), которая позволяет прервать порочный круг «нарастание тревоги-катастрофические фантазии-ритуал проверки состояния тела»» [3]. Суть метода заключается в обучении пациента выдерживать тревогу без прибегания к охранительному поведению (поиску симптомов в интернете, измерению давления, звонкам врачам). Дополнительно применяются техники парадоксальной интенции (например, назначение «часа болезни», когда пациенту предписывается намеренно думать о страхах в строго отведенное время) и десенсилизация в воображении.

Развитие когнитивных наук привело к появлению методов «третьей волны» КПТ, которые смещают фокус с борьбы с симптомами на изменение

отношения к ним. К. Кикас выделяет перспективность терапии принятия и ответственности (АСТ) и когнитивной терапии на основе осознанности (МВСТ) [5].

Если КПТ работает с симптомом и поведением, то глубинно-психологические подходы стремятся раскрыть смысл симптома. Гештальт-подход, представленный в работах Л.Л. Третьяка, рассматривает ипохондрию через призму нарушения контакта и механизмов прерывания. В этой парадигме «с позиций гештальт-подхода ипохондрическая тревога представляет собой проекцию в будущее некоего избегаемого переживания», а сам процесс фиксации на теле трактуется как «ретрофлексия внимания» [3]. Симптом здесь – это свернутая энергия, не нашедшая выхода во внешнюю среду. Целью терапии становится – перевод языка тела на язык чувств и потребностей.

В свою очередь, клинико-психотерапевтический подход М.Е. Бурно предлагает уникальную стратегию для пациентов с «сомневающейся» ипохондрией [1]. Помимо «разъяснительной терапии», апеллирующей к логике, центральное место занимает Терапия творческим самовыражением (ТТС). Данный экзистенциальный метод помогает пациенту найти опору в творчестве, природе, коллекционировании или изучении истории, тем самым смещая фокус с хрупкости тела на вечные ценности. Обретение смысла становится мощнейшим антидотом против страха физического уничтожения.

Несмотря на наличие эффективных методик, организационный аспект помощи пациентам с ипохондрией остается уязвимым.

А.Ю. Шадрина и О.В. Волкова в своем обзоре констатируют системный пробел, что «в исследованиях не представлены данные о внедрении программ экспресс-диагностики и краткосрочной помощи пациентам, имеющим упомянутые особенности личностного профиля» [4]. Данный дефицит стал особенно очевиден в условиях глобальных вызовов, таких как пандемия COVID-19, когда система здравоохранения столкнулась с массовой тревогой о здоровье. Авторы подчеркивают, что в таких условиях «решающее значение имеют оперативность и высокая эффективность техник экспресс-диагностики и краткосрочной помощи» [4], что ставит перед профессиональным сообществом задачу разработки новых, более компактных и доступных протоколов вмешательства.

Таким образом, консультирование клиентов с ипохондрией и страхом болезни – это процесс, требующий от специалиста интеграции знаний из психиатрии, когнитивной психологии и экзистенциальной философии. Дальнейшее развитие этой области должно быть направлено на создание интегративных моделей краткосрочной помощи, способных отвечать на вызовы современного мира.

Использованные источники:

1. Бурно М.Е. Психотерапия «сомневающейся» ипохондрии // Московский психотерапевтический журнал. 1994. №1.

2. Смулевич А.Б., Дороженко И.Ю., Романов Д.В., Львов А.Н. Ипохондрия sine materia как психосоматическая проблема (на модели ипохондрических расстройств, реализующихся в пространстве кожного покрова) // Журнал неврологии и психиатрии. 1. 2012. С. 14-25.
3. Третьяк Л.Л. Психотерапия невротической ипохондрии: стратегии и мишени практической работы // Центр «Искусство Перемен» Российская Психотерапевтическая Ассоциация [Электронный ресурс] // Режим доступа: <https://psymaster.spb.ru/articles/psixoterapiya-nevroticheskoy-ipohondrii/> (дата обращения: 21.01.2026).
4. Шадрина А.Ю. Теоретико-методологический обзор представлений об ипохондрическом типе отношения к болезни в психологических и медицинских исследованиях / А.Ю. Шадрина, О.В. Волкова // Психология. Психофизиология. 2021. Т. 14. № 4. С. 94-104.
5. Kikas K. et al. Illness anxiety disorder: a review of the current research and future directions // Current Psychiatry Reports. 2024.

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НАКОПЛЕНИЕ ЭНЕРГИИ И ЕЁ ХРАНЕНИЕ В ЭНЕРГОСИСТЕМЕ

Аннотация: В данной статье рассматривается анализ перспектив накопления и хранения энергии в современной энергосистеме с учетом разнообразных технологий хранения (интермодальные хранилища: балансирующие резервы, аккумуляторные системы, pumped hydro и др.).

Ключевые слова: энергия, накопитель, преобразователь, система хранения, источник, сглаживание, спрос, производство, генерация.

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ENERGY ACCUMULATION AND ITS STORAGE IN AN ENERGY SYSTEM

Abstract: This paper analyzes the prospects for energy accumulation and storage in a modern energy system, taking into account various storage technologies (intermodal storage: balancing reserves, battery storage systems, pumped hydro, and others).

Keywords: energy, accumulator, converter, storage system, source, smoothing, demand, production, generation.

Введение. Современные технологии накопления электроэнергии существенно упрощают установку возобновляемых источников энергии в большом количестве, при помощи которых появляется возможность обеспечения электроэнергией, в то время, когда возобновляемые источники по каким-то причинам не могут этого сделать.

Цель работы - анализ и выбор накопителей энергии разнообразного типа.

Метод решения. Современные направления развития электроэнергетических систем зачастую связаны с обширным внедрением новейших

технологий, особенно генерации при помощи возобновляемых источников энергии, таких как солнечные панели, ветрогенераторы и т.д., автоматизированные системы управлением переменным током, благодаря чему появляется возможность вводить в эксплуатацию новые генерирующие мощности и способность снизить напряженность в экологической среде от электроэнергетики [1].

Энергетическая система — это система, обеспечивающая производство, передачу, распределение и использование энергии. Сбор (генерация) энергии — процесс производства энергии из различных источников, а хранение энергии — накопление энергии для последующего использования. К основным способам генерации энергии относятся солнечная энергия (*solnechnaya energiya*) — используется в солнечных электростанциях (СЭС), энергия ветра (ветровая энергия) — применяются ветровые электростанции (ВЭС) и тепловая энергия (*teplovaya energiya*) — например, газовые электростанции.

Развитие системы генерации и накопления энергии направлено на обеспечение энергетической безопасности, снижение зависимости от традиционных источников топлива и сокращение выбросов парниковых газов.

Накопитель энергии, это устройство, воспринимающее, сохраняющее и выделяющее энергию для использования без преобразования её вида. Накопители энергии различаются объёмом запасаемой энергии, скоростью её накопления и отдачи («зарядки» и «разрядки»), удельной энергоёмкостью (плотностью накопленной энергии), возможными сроками её хранения и другими параметрами, включая надёжность и стоимость изготовления и обслуживания. Например, при производстве электрической энергии с использованием возобновляемых источников (вода, ветер, солнце и др.) возникает проблема непостоянства их мощности. Поэтому энергию источника при её избытке необходимо запасти в накопителе энергии, а затем уже расходовать эту накопленную энергию в необходимом количестве. При этом накопитель энергии будет играть роль демпфирующего устройства, сглаживающего колебания мощности источника (например, гидроаккумулирующая электростанция). Если вид энергии при этом меняется, например с электрической на механическую, то этот переход осуществляет преобразователь энергии, в данном случае электродвигатель.

Все накопители энергии делятся по виду энергии, с помощью которого происходит хранение (рис.1):



Рис.1. Классификация накопителей энергии по виду энергии [2].

Не рассматриваются малозначимые с энергетической точки зрения накопители, например флуоресцирующие составы – накопители световой энергии.

Системы хранения электроэнергии (ЭЭ) разделяют на системы промышленного хранения энергии, характеризующиеся относительно большой емкостью, и относительно малые накопители, используемые для нужд домохозяйств и индивидуальных потребителей [3].

Наиболее распространенным способом (99% мировых мощностей) промышленного хранения электроэнергии являются механические системы, в первую очередь – гидроаккумулирующие.

Рассмотрим накопители электроэнергии. Из множества электрических аккумуляторов наиболее перспективными для применения как в бытовой электронной технике, так и в электромобилях являются литий-ионные аккумуляторы. Их удельная энергоёмкость (одна из самых высоких для электрических аккумуляторов) 400–720 кДж/кг, удельная мощность около 300 Вт/кг. Важное достоинство – отсутствие так называемой эффекта памяти (низкий уровень саморазряда); недостатки – относительно небольшой срок службы (свыше 1000 циклов), подверженность старению (срок службы не более 5 лет). Из ёмкостных накопителей наиболее перспективны электрохимические конденсаторы (суперконденсаторы, или ионисторы), которые, по мнению отечественных и зарубежных специалистов, в будущем могут вытеснить электрохимические аккумуляторы. Удельная энергоёмкость их в десятки раз больше, чем у обычных электролитических конденсаторов.

Любая катушка индуктивности является индуктивным накопителем электроэнергии, но срок хранения энергии ничтожен из-за активного сопротивления обмоток. В условиях сверхпроводимости индуктивные накопители приобретают техническую реальность.

Системы хранения энергии (Bess-Battery Energy Storage Systems) позволяют сохранять запасную энергию и использовать ее при пиковом спросе или нестабильности энергосистемы. Они играют ключевую роль в стабилизации энергосистемы, особенно при использовании возобновляемых источников энергии, поскольку генерация зависит от погодных условий.

Такие системы хранения энергии помогают сглаживать колебания в энергосистеме, увеличивать долю "зеленой" энергетики и повысить надежность энергосистемы.

Балансирующие резервы — это специальные мощности в энергосистеме, предназначенные для оперативного устранения небалансов между производством и потреблением электроэнергии, вызванных непредвиденными изменениями нагрузки, ошибками прогнозирования выработки (особенно от ВИЭ — ветровых и солнечных станций) и аварийными отключениями генераторов или линий электропередачи.

Система аккумуляторов содержит отдельные аккумуляторные элементы, которые преобразуют химическую энергию в электрическую и обратно. Элементы собраны в модули, которые, в свою очередь, образуют аккумуляторные блоки.

Технология pumped hydro (PSH) — это система хранения энергии, в которой используется вода и гравитация для хранения и выпуска электричества. Принцип работы: в периоды низкого спроса на энергию электричество используется для перекачивания воды из нижнего резервуара в верхний. Когда спрос на энергию высокий, накопленная вода сбрасывается обратно в нижний резервуар через турбины, генерируя электричество. Преимущества технологии- это большая ёмкость хранения по сравнению с батареями, что делает её подходящей для управления энергией в крупных масштабах, долгий срок службы, часто превышающий 50 лет и высокая эффективность, обычно в диапазоне 70–80%.

При хранении энергии различают несколько методов, таких как длительное хранение энергии и быстро высвобождаемой. Некоторые технологические методы больше заточены под обеспечение коротких всплесков электроэнергии для приложений, которые обеспечивают качество электроэнергии, к примеру, сглаживание выработки возобновляемых источников энергии от часа к часу. Так же, оборудование выйдет из строя если поток электроэнергии вдруг станет резким и неплавным [1].

Возобновляемая электроэнергия или другая доступная продукция могут храниться в периоды низкого спроса и высвободиться в периоды более высокого спроса. Ниже приведен график, показывающий зависимость выравнивания нагрузки или снижение пиковой нагрузки, относится к использованию электроэнергии, хранящейся в периоды низкого спроса, для удовлетворения пикового спроса на электроэнергию в тот же день, но чуть позже (рис.2):

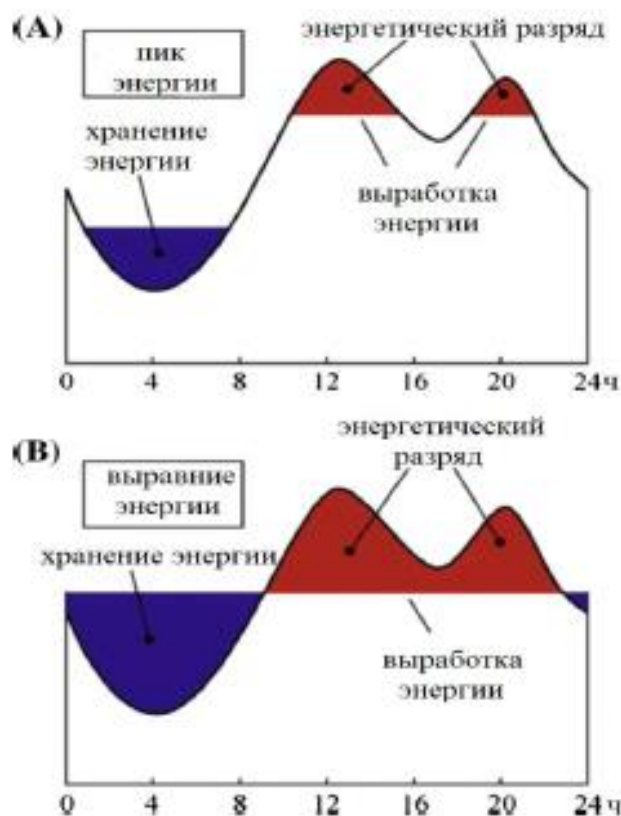


Рис.2. Однодневный профиль нагрузки системы хранения электроэнергии [4].

Системы хранения электроэнергии выполняют ряд значимых функций:

1. Служат основным источником энергии (а также являются аварийным источником энергии), так как могут полностью обеспечивать потребителей постоянным и бесперебойным электроснабжением длительный период времени без подключения к электрическим сетям.

2 Регулируют параметры системы – снижают потери электроэнергии, выравнивают пиковые нагрузки в сети и повышают ее качество за счет регулярного управления напряжением и частотой.

3 Оптимизируют потребление, то есть управляют графиком потребления за счет частичного обеспечения электроснабжения или аккумуляции электроэнергии [5].

Вывод. Накопители энергии находят все более широкое применение в электроэнергетических системах, автономных энергетических установках, транспортных системах, бортовом оборудовании, технологической аппаратуре, электрофизических стендах и т. д.

Эффекты при использовании накопителей энергии - для генерации: использование накопителей позволит улучшить процесс производства электроэнергии за счёт выравнивания графика нагрузки, а также позволит избавить тепловую генерацию от роли регулятора. В свою очередь это позволит снизить расходов на углеводородное топливо, повышения коэффициента использования установленной мощности электростанций, снизить потребность в строительстве новых электростанций и повысить надёжность снабжения электричеством потребителя.

Исходя из вышеуказанных, можно прийти к выводу что:

- использование накопителей энергии эффективно решает проблему несовпадения графиков производства и потребления электроэнергии, это особенно важно для автономных энергосистем, где спрос на электроэнергию не всегда совпадает с её выработкой;

- применение систем накопления энергии позволяет повышать надёжность и стабильность электроснабжения, создавать запасы энергии на время возможных перебоев или неисправностей, сглаживать пиковые нагрузки [6];

- использование накопителей позволяет оптимизировать потоки энергии и хранить её невостребованные объёмы, полученные при избытке альтернативной генерации;

- в будущем системы накопления энергии могут играть ключевую роль

в развитии возобновляемых источников энергии и уменьшении негативного воздействия человеческой деятельности на окружающую среду;

- дальнейшее развитие систем накопления энергии может привести к созданию более эффективных, экологически чистых и безопасных решений в области энергетики.

Использованные источники:

1. Н.В. Фролов. Применение сетевых накопителей электрической энергии в системах электроснабжения: магистерская диссертация – Тольятти, 2023.- 76 с.
2. Марьенков С. А. Применение технологии накопления электрической энергии для увеличения надежности системы электроснабжение на базе возобновляемых источников электрической энергии// Международный научно-исследовательский журнал. 2016 № 6 (48), ч. 2 С. 103–107.
3. Приоритетные направления, ключевые технологии и сценарии развития систем накопления энергии / Л. В. Калимуллин, Д. К. Левченко, Ю. Б. Смирнова, Е. С. Тузикова // Вестник ИГЭУ. 2019 № 1 С. 42–54.
4. П.А.Воронин, Силовые полупроводниковые ключи: семейства, характеристики, применение/М.: Издательский дом “ДодекаXXI”, 2018.–384 с.
5. Лисогурский И. А., Лисогурская Л. Н. Накопители электрической энергии: Функции и перспективные технологические направления развития // Вестник магистратуры. 2018 № 12-4 (87). С. 44–45.
6. Каманина М.А. и др. НИУ «Московский энергетический институт». Межд. научный журнал «ВЕСТНИК НАУКИ» № 7 (64) Т.1. Июль 2023 г.
7. Рустамов Н. Т. и др. Коэффициент полезного действия фрактальных солнечных коллекторов //Экономика и социум. – 2025. – №. 2-2 (129). – С. 405-412.
8. Мухаммадиев Б. С. НАПРЯЖЕННО-ДЕФОРМИРОВАННОЕ СОСТОЯНИЕ МАТЕРИАЛОВ (УЗЛОВ И ДЕТАЛЕЙ) КОНСТРУКЦИИ В

МАШИНОСТРОЕНИИ //Экономика и социум. – 2025. – №. 2-2 (129). – С. 363-367.

9. Saparovich M. B., Akbarovna K. M. ISHLAB CHIQRISHDA QO'LLANILADIGAN O'ZGARTKICHLARNING ASOSIY XUSUSIYATLARI VA ISHLASH TAMOIYILLARI //INNOVATION IN THE MODERN EDUCATION SYSTEM. – 2024. – Т. 5. – №. 47. – С. 255-261.

10. Мухаммадиев Б. С., Эшонкулова М. Н. Определение оптимальных соотношений параметров преобразователя механических напряжений с дискретным выходом //Экономика и социум. – 2021. – №. 11-2 (90). – С. 207-211.

11. Мухаммадиев Б. С. МЕТРОЛОГИЧЕСКОЕ ОБЕСПЕЧЕНИЕ ПРОИЗВОДСТВА В МАШИНОСТРОИТЕЛЬНОЙ ОТРАСЛИ //Экономика и социум. – 2025. – №. 11-2 (138). – С. 872-875.

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ИНТЕГРАТИВНЫЕ МЕТОДЫ ПСИХОТЕРАПИИ В ЛЕЧЕНИИ ПОСТТРАВМАТИЧЕСКОГО СТРЕССОВОГО РАССТРОЙСТВА У ВЗРОСЛЫХ: КЛИНИЧЕСКАЯ ЭФФЕКТИВНОСТЬ И СТРАТЕГИИ ВМЕШАТЕЛЬСТВА

Резюме: Посттравматическое стрессовое расстройство (ПТСР) представляет собой тяжёлое психическое состояние, развивающееся в ответ на переживание экстремального травматического события, угрожающего жизни, здоровью или целостности личности. В последние годы отмечается рост числа обращений за психотерапевтической помощью по поводу ПТСР, особенно среди ветеранов, жертв насилия, аварий, катастроф и миграционных кризисов. В условиях возрастающего запроса на персонализированную и гибкую помощь всё большее значение приобретают интегративные методы психотерапии, сочетающие подходы из разных школ.

Целью данного исследования является анализ эффективности интегративных психотерапевтических стратегий, применяемых для лечения ПТСР у взрослых, а также определение ключевых факторов, влияющих на устойчивость результатов терапии. Методология основана на систематическом обзоре современных психотерапевтических подходов, включающих когнитивно-поведенческую терапию (КПТ), EMDR (десенсибилизация и переработка движением глаз), элементы гештальт-терапии, телесно-ориентированные практики и майндфулнес.

Результаты показывают, что использование комбинированных методов значительно повышает устойчивость ремиссии, снижает выраженность симптомов тревоги и флэшбэков, способствует восстановлению эмоциональной регуляции и повышению уровня социального функционирования. Особенно эффективной оказывается модуляция терапии в зависимости от фазы ПТСР (острая, затяжная, хроническая), а также индивидуальных психотипологических особенностей пациента.

Таким образом, интегративный подход позволяет не только гибко адаптировать терапию под конкретного пациента, но и минимизировать риск *retraumatization*, повысить уровень доверия и устойчивость

мотивации. Дальнейшие исследования должны быть направлены на разработку структурированных протоколов, адаптированных к разным культурным и клиническим условиям.

Ключевые слова: ПТСР, психотерапия, интегративный подход, КПТ, EMDR, клиническая эффективность, взрослые пациенты.

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INTEGRATIVE PSYCHOTHERAPY METHODS IN THE TREATMENT OF POST-TRAUMATIC STRESS DISORDER IN ADULTS: CLINICAL EFFECTIVENESS AND INTERVENTION STRATEGIES

Resume: Post-Traumatic Stress Disorder (PTSD) is a severe psychological condition resulting from experiencing or witnessing traumatic events involving threats to life, health, or personal integrity. In recent years, the demand for psychotherapeutic support for PTSD has increased significantly, particularly among veterans, victims of violence, accidents, disasters, and forced migration. In this context, integrative psychotherapy approaches, which combine elements from various schools, have gained importance.

This paper aims to analyze the clinical effectiveness of integrative psychotherapeutic strategies in the treatment of PTSD in adults and to identify the key factors that determine long-term therapeutic success. The methodology is based on a systematic review of therapeutic modalities, including cognitive behavioral therapy (CBT), EMDR (Eye Movement Desensitization and Reprocessing), gestalt therapy elements, body-oriented techniques, and mindfulness-based interventions.

Results indicate that combined approaches significantly improve long-term outcomes, reduce symptom severity (anxiety, flashbacks), enhance emotional regulation, and improve social functioning. The adaptability of therapy depending on PTSD phase (acute, delayed, chronic) and individual psychological profiles is critical for success.

Thus, an integrative approach allows for personalized, flexible, and phase-sensitive treatment while minimizing retraumatization and fostering therapeutic alliance. Future studies should focus on culturally adaptive and clinically standardized intervention protocols.

Keywords: PTSD, psychotherapy, integrative approach, CBT, EMDR, clinical outcomes, adults.

Актуальность. Посттравматическое стрессовое расстройство (ПТСР) признано одной из наиболее тяжёлых форм психических нарушений, возникающих вследствие экстремального психотравмирующего события. Оно сопровождается устойчивыми нарушениями в эмоциональной сфере, поведенческими расстройствами, дисрегуляцией памяти и восприятия, а также нарушением социальных и профессиональных функций. Актуальность данной проблемы обусловлена не только высокой распространённостью ПТСР в мировом населении, но и недостаточной эффективностью традиционных терапевтических вмешательств у значительного числа пациентов.

По данным ВОЗ, до 3,6% взрослого населения мира страдают от ПТСР, а в регионах, охваченных военными конфликтами, катастрофами, миграционными кризисами и эпидемиями, эта цифра возрастает в 3–5 раз. Особенно уязвимыми группами являются ветераны боевых действий, жертвы насилия (в том числе сексуального и бытового), беженцы, пострадавшие от природных катастроф, а также медицинские работники, сталкивающиеся с тяжёлыми клиническими ситуациями [3].

Несмотря на наличие разработанных психотерапевтических моделей, таких как когнитивно-поведенческая терапия (КПТ), экспозиционная терапия и EMDR, нередко наблюдается частичная устойчивость симптомов, высокая вероятность рецидивов и снижение мотивации к лечению. Это связано как с индивидуальными различиями в клинической картине, так и с коморбидной психопатологией (депрессия, тревожные расстройства, зависимости), а также социальной и культурной средой пациента [1,4,5].

В этих условиях растёт интерес к интегративным моделям психотерапии, которые предполагают объединение техник различных направлений (КПТ, EMDR, психоанализа, гештальт-терапии, телесно-ориентированной терапии, майндфулнес и др.) в зависимости от конкретных особенностей случая. Интегративный подход позволяет учитывать динамику симптомов, структуру личности, мотивационный ресурс и фазу течения расстройства. Это делает лечение более гибким, персонализированным и адаптированным к реальным запросам пациента [6,9].

Кроме того, в клинической практике всё чаще поднимается вопрос кросс-культурной применимости психотерапии при ПТСР, особенно среди мигрантов, этнических меньшинств и пациентов с религиозной или этнокультурной чувствительностью. Интегративные подходы позволяют снимать напряжение между западными протоколами и локальными традициями психосоциальной поддержки [11].

Наконец, постковидная реальность, сопровождающаяся ростом тревожных, депрессивных и стрессовых расстройств, резко обострила необходимость в эффективных, краткосрочных и воспроизводимых методах

психотерапевтической помощи [10]. Интегративная модель терапии ПТСР с учётом мультифакторной природы расстройства (биопсихосоциальной) становится не только клинически, но и социально-экономически обоснованной стратегией.

Таким образом, исследование эффективности интегративных методов психотерапии при ПТСР является своевременным, практически значимым и отвечает задачам современной доказательной медицины и психологической практики.

Цель исследования. Оценить клиническую эффективность интегративных психотерапевтических подходов в лечении посттравматического стрессового расстройства у взрослых, а также определить оптимальные стратегии вмешательства с учётом стадии ПТСР, психотипа пациента и сопутствующих нарушений.

Материалы и методы исследования. Проведено клинико-психологическое сравнительное исследование, направленное на оценку эффективности различных психотерапевтических подходов у взрослых пациентов с посттравматическим стрессовым расстройством (ПТСР). Исследование носило проспективный, квазиэкспериментальный характер с включением контрольной группы.

Результаты исследования. В ходе исследования были проанализированы клинико-психологические данные 72 взрослых пациентов с диагностированным посттравматическим стрессовым расстройством (ПТСР), которые проходили лечение в амбулаторных условиях. Пациенты были разделены на две группы:

– **основная группа (n=36)** получала интегративную психотерапию (КПТ, EMDR, майндфулнес, телесные практики);

– **контрольная группа (n=36)** проходила монотерапию когнитивно-поведенческой терапией по стандартному протоколу.

После прохождения 12-недельного курса терапии в основной группе средний балл по шкале PCL-5 снизился с 62,1 до 29,3 ($p < 0,001$), что соответствует значительному уменьшению выраженности симптомов. В контрольной группе снижение составило с 60,8 до 39,4 ($p < 0,01$), что также демонстрирует эффект, но менее выраженный.

Группа	До терапии (PCL-5)	После терапии (PCL-5)	Δ Изменение	p-значение
Основная (интегр.)	62,1 $\pm$ 8,4	29,3 $\pm$ 6,1	-32,8	<0,001
Контрольная (КПТ)	60,8 $\pm$ 7,9	39,4 $\pm$ 7,6	-21,4	<0,01

Эмоциональное состояние и коморбидные симптомы

По шкале депрессии Бека (BDI) улучшения в основной группе были более выраженными: снижение среднего балла с 25,6 до 11,3 (умеренная $\rightarrow$ минимальная депрессия), в то время как в контрольной группе — с 24,9 до 16,4.

По шкале тревожности Спилберга средние показатели уменьшились в основной группе на **41%**, в контрольной — на **28%**. Это подтверждает более быструю регуляцию аффективных реакций при интегративной терапии.

Качество жизни (по WHOQOL-BREF)

Показатели по шкале качества жизни WHOQOL-BREF выросли во всех доменах (физическом, психологическом, социальном и средовом), но особенно — в психологической сфере:

Домен	Основная группа (Δ)	Контрольная группа (Δ)
Физическое здоровье	+18,2%	+11,4%
Психологическое	+27,9%	+15,7%
Социальные связи	+22,6%	+13,3%
Окружающая среда	+16,4%	+10,9%

Стабильность терапевтического эффекта

Через 3 месяца после окончания курса терапии 83% пациентов основной группы сохраняли ремиссию симптомов, в то время как в контрольной группе — 64%. Это может быть связано с тем, что интегративная модель терапии формировала у пациентов более широкий спектр навыков саморегуляции и глубже прорабатывала травматические переживания.

Терапевтический альянс и удовлетворённость

Шкала WAI (Working Alliance Inventory) показала, что субъективное чувство доверия и вовлечённости в терапевтический процесс было выше у пациентов основной группы. Средний балл составил 5,4 против 4,6 (из 7 возможных). Пациенты отмечали, что разнообразие методов позволяло «не застревать» в трудных темах и чувствовать поддержку.

Вывод. Интегративная психотерапия продемонстрировала высокую клиническую эффективность при лечении ПТСР по сравнению со стандартной монотерапией КПТ.

Наблюдалось более выраженное снижение тревожно-депрессивной симптоматики и улучшение качества жизни.

Комбинированные методы повышали устойчивость ремиссии и способствовали лучшему терапевтическому альянсу.

Результаты подтверждают целесообразность разработки персонифицированных интегративных протоколов лечения ПТСР.

Использованные источники:

1. Абрамова Г.С. *Психология травмы: диагностика, коррекция, профилактика*. — М.: Смысл, 2019. — 312 с.
2. Баранов П.А., Осипова Н.И. Эффективность когнитивной терапии при ПТСР. // *Вестник психотерапии*, 2021. — № 3. — С. 42–47.
3. Братусь Б.С. *Аномалии личности: структура и терапия*. — М.: Институт психотерапии, 2018. — 368 с.
4. Винокур В.М., Суркова А.В. Интегративная психотерапия в лечении последствий психотравмы. // *Журнал практического психолога*, 2020. — № 6. — С. 55–61.

5. Гилёва И.В., Махмудов А.Ф. Использование EMDR при комплексном лечении ПТСР. // *Неврология и психиатрия*, 2022. — № 2. — С. 29–33.
6. Емельянов С.Ю. Психотерапевтические подходы при хроническом ПТСР. // *Современная клиническая психология*, 2021. — № 1. — С. 19–24.
7. Лебединский В.В. *Психотерапия пограничных состояний*. — СПб.: Речь, 2017. — 400 с.
8. Рахимова Г.Н. Комплексная психокоррекция у жертв насилия с симптомами ПТСР. // *Медико-психологический журнал*, 2020. — № 4. — С. 31–36.
9. Bisson J.I., Cosgrove S., Lewis C., Roberts N.P. Post-traumatic stress disorder. // *BMJ*, 2015. — Vol. 351. — h6161.
10. Foa E.B., Keane T.M., Friedman M.J. *Effective Treatments for PTSD: Practice Guidelines from the International Society for Traumatic Stress Studies*. — New York: Guilford Press, 2020. — 528 p.
11. Hofmann S.G., Asnaani A., Vonk I.J., Sawyer A.T., Fang A. The Efficacy of Cognitive Behavioral Therapy: A Review of Meta-analyses. // *Cognitive Therapy and Research*, 2012. — Vol. 36. — P. 427–440.
12. Shapiro F. *Eye Movement Desensitization and Reprocessing (EMDR) Therapy: Basic Principles, Protocols, and Procedures*. — New York: Guilford Press, 2018. — 576 p.
13. van der Kolk B.A. *The Body Keeps the Score: Brain, Mind, and Body in the Healing of Trauma*. — New York: Penguin Books, 2015. — 464 p.

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ФОРМИРОВАНИЕ ПРОФЕССИОНАЛЬНЫХ НАВЫКОВ У СТУДЕНТОВ КОЛЛЕДЖЕЙ

***Аннотация:** В статье рассмотрена проблема формирования профессиональных навыков у студентов колледжей по направлению архитектурной деятельности. Актуальность темы обусловлена востребованностью профессии в трудовом рынке, где качество и уровень работы выявляется применением навыков в реальной жизни. Раскрыта сущность понятия профессиональных навыков и умение применять полученные навыки в реальных ситуациях. Выявлены структурные компоненты профессиональной компетентности архитекторов.*

***Ключевые слова:** профессиональные навыки, профессиональные компетенции, студенты колледжей, среднее профессиональное образование, hard skills, soft skills, digital skills, практико-ориентированное обучение, проектная деятельность, профессиональная подготовка специалистов.*

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FORMATION OF PROFESSIONAL SKILLS AMONG COLLEGE STUDENTS

***Abstract:** The article examines the problem of forming professional skills among college students in the field of architectural activity. The relevance of the topic is determined by the demand for this profession in the labor market, where the quality and level of work are revealed through the application of skills in real-life situations. The essence of the concept of professional skills and the ability to apply acquired skills in real situations is disclosed. The structural components of the professional competence of architects are identified.*

***Keywords:** professional skills, professional competencies, college students, secondary vocational education, hard skills, soft skills, digital skills, practice-oriented learning, project-based activities, professional training of specialists.*

На современном этапе развития общества процесс обучения должен обеспечивать каждому будущему специалисту не только фундаментальные теоретические знания, но и широкий спектр практических профессиональных умений и навыков, а также профессионально значимых качеств личности [1].

Для работодателей сегодня востребован специалист с высоким уровнем профессиональной подготовки, но и умеющие пользоваться профессиональными навыками в реальных трудных ситуациях, обладающие навыками организационной и управленческой работой. К тому же, работодатель хочет, чтоб выпускники были способны адекватно оценивать, результат своей профессиональной деятельности.

Формирование профессиональных компетенций будущих выпускников программ подготовки специалистов среднего звена, различных специальностей осуществляется в рамках изучения, как общепрофессиональных дисциплин, так и профессиональных модулей. Причем, общепрофессиональные дисциплины, как мы считаем, будут занимать важное место в подготовке будущих специалистов во всех образовательных организациях среднего профессионального образования.

Для преподавателя важно понимать разницу профессиональных компетенций от умений и знаний, получаемых во время урока. Умения и знания составляют основу профессиональной компетенции, которая в свою очередь зависит от критического мышления студента. Профессиональная компетенция – это **интегрированная способность успешно применять их в комплексе с личностными качествами для эффективного решения конкретных рабочих задач и достижения результата.**

Важно уметь классифицировать навыки, полученные во время определенных занятий. Профессиональные навыки подразделяют в основном на 3 вида: **hard skills, soft skills, digital skills.**

Hard skills – (англ. "жесткие" навыки), это навыки, к которым студента можно обучить, т.е. эти навыки студент получает от преподавателя и их можно измерить в определенном порядке. Эти навыки в какой-то степени можно считать теоретическими и их освоенность можно проверить с помощью экзамена.

Soft skills – (англ. "мягкие" навыки), это навыки, которых гораздо сложнее измерить. В частности, их можно назвать личностными качествами, т.к. они зависят от характера, темперамента, интересов и личного опыта.

Digital skills – (англ. «цифровые» навыки), цифровые навыки, которые для студента 21 века должны быть на высшем уровне, за счет развития информационных технологий. В более широком смысле digital skills можно понимать как «навыки в области цифровых технологий». Это знания и умения, связанные с использованием компьютеров, гаджетов, Интернета и цифровых технологий для различных целей.

Таким образом, в развитии профессиональных качеств каждое умение имеет свое определенное значение. Эффективная профессиональная деятельность выпускника возможна лишь при гармоничном развитии всех

трёх групп навыков, так как каждая из них выполняет взаимодополняющую функцию в процессе профессионального становления личности.

В развитии профессиональных навыков нужно учитывать возраст и психическое состояние студента. Студенты профессиональных техникумов и колледжей в среднем бывают в возрасте 16-25 лет. В данном случае, студенты в возрасте 22 и старше владеют более богатым личностным опытом, что способствует их поведению и качествам. В то время, как студенты, которые совсем недавно окончили 9 класс школы, в сравнении с первой группой студентов имеют не столь богатый личный опыт. Это в свою очередь и говорится их поведением, ответами во время занятий и усвоением программы.

Не меньше важное значение имеет применение практических и лабораторных навыков для лучшего понимания теоретических знаний. В качестве примера можно привести создание макета моста или башни используя макароны для приготовления спагетти и самый важный аспект этого задания – макет должен удерживать вес около 50-60 кг. Да, на первый взгляд это кажется нереальным, но используя знания полученные во время занятий воплотить такой проект в жизнь является реальным. В данной задаче, в первую очередь, нужно обратить внимание на то, как распределяется тяжесть: важно учесть равномерное распределение тяжести по всей конструкции, нужно, чтобы вес не удерживался в одной точке, а передавалась через систему взаимосвязанных элементов. А также нельзя забывать про симметричность и форму проекта, ведь именно симметричность определяет её прочность.

Эксперименты с мостами из спагетти позволяют наглядно продемонстрировать роль формы, геометрии и распределения нагрузки в обеспечении устойчивости конструкций. Несмотря на низкие механические характеристики материала, грамотно организованная структура способна выдерживать значительные нагрузки, что подтверждает первостепенное значение конструктивной схемы по сравнению с прочностью материала. Такие проекты позволяют студентам ориентироваться не только на вид конструкции, но и её прочность и долговечность, что также оказывается на их дальнейшей работе в качестве архитектора.

Формирование профессиональных навыков у студентов колледжей является ключевым условием подготовки конкурентоспособных и востребованных специалистов в современных социально-экономических условиях. Эффективность профессиональной подготовки напрямую зависит от комплексного развития профильных, универсальных и цифровых навыков, обеспечивающих готовность выпускников к практической деятельности и адаптации на рынке труда.

Анализ показал, что наибольший потенциал в формировании профессиональных навыков имеют практико-ориентированные методы обучения, проектная деятельность, использование цифровых технологий и активное взаимодействие образовательных организаций с работодателями. Данные подходы способствуют не только освоению профессиональных

компетенций, но и развитию коммуникативных качеств, ответственности, самостоятельности и способности к профессиональному росту.

Использованные источники:

1. Гильмиярова С. Г., Гарипова Ф. М., Тихонова Л. Формирование профессиональной компетентности студентов колледжей // Электронная библиотека научных публикаций "CyberLeninka". 2017. — URL: <https://cyberleninka.ru/article/n/formirovanie-professionalnoy-kompetentnosti-studentov-kolledzhey/viewer>
2. Шейнкер А. Д., Копылов С. Н. Модель формирования компетенций у студентов колледжа через общепрофессиональную дисциплину «Инженерная графика» // Техническое регулирование в едином экономическом пространстве : материалы IX Всероссийской научно-практической конференции с международным участием, 19 мая 2022 г., Екатеринбург : Российский государственный профессионально-педагогический университет, 2022. — С. 184–187. ISBN 978-5-91256-560-1.
3. Digital skills: что это такое, зачем они нужны и как их развить [Электронный ресурс]. — URL: <https://4brain.ru/blog/digital-skills-chto-eto-takoe-zachem-oni-nuzhny-i-kak-ih-razvit>.
4. Что такое hard и soft skills: в чем разница и что важнее [Электронный ресурс]. — URL: <https://proforientator.ru/publications/articles/chto-takoe-hard-i-soft-skills-v-chem-raznitsa-chto-vazhnee.html>

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ПСИХОГИГИЕНА КАК ОДИН ИЗ ОБЯЗАТЕЛЬНЫХ ПРОФЕССИОНАЛЬНЫХ НАВЫКОВ ЧЕЛОВЕКА В УСЛОВИЯХ ШИРОКОГО РАСПРОСТРАНЕНИЯ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА

***Аннотация:** В современном обществе развивается использование технологий искусственного интеллекта. Одним из неочевидных недостатков искусственного интеллекта является прямое влияние на психику человека, которое необходимо распознать, исследовать и предотвратить. Установлено, что психологи работают над понятием психогигиены использования новых технологий, включая использование моделей искусственного интеллекта. Сформулированы возможные угрозы ментальному здоровью людей, постоянно сталкивающихся с необходимостью использования искусственного интеллекта, и оценена важность их предотвращения для эффективной работы.*

***Ключевые слова:** искусственный интеллект, психогигиена, типы привязанности, идентичность, технологии.*

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PSYCHOHYGIENE AS ONE OF THE MANDATORY PROFESSIONAL SKILLS OF A PERSON IN THE CONTEXT OF WIDESPREAD ARTIFICIAL INTELLIGENCE

***Abstract:** The use of artificial intelligence technologies is developing in modern society. One of the unobvious disadvantages of artificial intelligence is the direct impact on the human psyche, which must be recognized, investigated and prevented. It has been established that psychologists are working on the concept of psychohygiene using new technologies, including the use of artificial intelligence models. Possible threats to the mental health of people who are constantly faced with the need to use artificial intelligence are formulated, and the importance of their prevention for effective work is assessed.*

***Keywords:** artificial intelligence, psychohygiene, types of attachment, identity, technology.*

В эпоху, в которой искусственный интеллект (ИИ) молниеносно набирает популярность и изменяет не только ежедневную рутину человека, но и его профессиональную среду, важность поддержания психологического состояния становится все более очевидной. Широкое использование инструментов на базе ИИ – от чат-ботов до систем прогнозирования – не просто изменяет способ работы, создавая новые возможности и трудности, но и может влиять на психологическое состояние. В такое время как никогда становится важным, как само понятие психогигиены как части гигиены, направленной на сохранение и укрепление нервно-психологического состояния здоровья [1], так и распространение знаний о ней в современном обществе. Эти знания и практическое их применение становится не только залогом личностного благополучия, но и одной из главнейших характеристик эффективного сотрудника.

Общеизвестно, что технология представляет собой совокупность методов и приемов, характерных для какого-либо производства (нередко требующего особого искусства, мастерства), а также науку, изучающую физические, химические, механические и др. закономерности, действующие в технологических (производственных) процессах [2]. Распространение технологий на постоянной основе изменяет структуру деятельности человека. Рассматривая психику и деятельность как два неразрывных феномена, влияющих друг на друга, можно сделать обоснованный вывод о том, что, меняя структуру деятельности, человек изменяет и собственную психику [3].

В современном мире новые технологии характеризуются все большей и большей удаленностью от «натуральных способностей» человека [4]. Это порождает сразу несколько проблем в использовании этих технологий:

А. Магическое мышление. Взаимодействие с технологиями, механизм которых не до конца понятен человеку и разбираться в котором он не планирует, может вызвать когнитивные искажения. Одним из них может стать распространение магического мышления на сложные и неочевидные по своей работе инструменты.

Магическое мышление в общем виде можно охарактеризовать как умственные действия по мысленной обработке сверхъестественных событий, которые нарушают законы физики, биологии и психологии [5]. Конечно, ИИ не является сверхъестественным явлением в полном смысле слова, однако психика человека, склонная защищаться от новых и непонятных явлений, может воспринимать его как таковой. При этом недостаток знаний может компенсироваться человеческой психикой представлением об идеализированном, магическом свойстве ИИ, который также подпитывается со стороны самих создателей. Эти неосознанные установки могут отодвинуть активную позицию пользователя и сделать его в некотором смысле подчиненным магическому образу ИИ. Важно отметить, что таким рискам наиболее подвержены люди, чья личностная predisposition уже несколько пассивна, неустойчива.

Б. *Типы привязанности.* Взаимодействие человека с ИИ определяется разными типами привязанности человека [6]:

1) безопасный тип привязанности – человек демонстрирует наиболее здоровую и адаптивную модель взаимодействия с ИИ, т.е. воспринимает ИИ именно как инструмент – функциональный и полезный. Человек спокойно делегирует ИИ задачи, не испытывая необходимости в тотальном контроле, но при этом понимает его ограничения и не возлагают нереалистичных ожиданий. Поэтому человек адекватно реагирует на ошибки алгоритма, видя в них возможность скорректировать запрос, и легко адаптируется к обновлениям, воспринимая их как естественное развитие. Все это позволяет использовать ИИ с максимальной эффективностью, превращая его в партнера продуктивной деятельности, не проецируя на него внутренние конфликты;

2) тревожный тип привязанности – человек многократно перепроверяет работу алгоритма, опасаясь ошибок, и испытывает стресс при любых изменениях, так как видит в этом угрозу стабильности. Даже при наличии четкого осознания, что ИИ – это просто программа, такой человек будет наделять инструмент чертами субъектности, стараясь быть вежливым и подстраиваясь под его «ожидания», чтобы не быть отвергнутым или неправильно понятым. Для человека с тревожным типом привязанности взаимодействие с ИИ становится источником постоянного беспокойства и неуверенности. В результате, вместо того чтобы быть инструментом, ИИ становится объектом для проекции внутренней тревоги, что значительно снижает эффективность взаимодействия и увеличивает психологическую нагрузку;

3) избегающий тип привязанности – характеризуется установкой на дистанцирование и минимизацию взаимодействия с ИИ. Главная цель такого пользователя – сохранить автономию и контроль, не полагаясь на «ненадежный» алгоритм. Он предпочитает делать все вручную, так как не доверяет результатам работы ИИ, и после первой же ошибки может полностью отказаться от его использования. В результате избегающая привязанность мешает в полной мере воспользоваться преимуществами технологии, так как пользователь сознательно ограничивает ее функционал, руководствуясь не объективными недостатками ИИ, а своей внутренней установкой на дистанцирование;

4) дезорганизованный тип привязанности – проявляется в хаотичном, непоследовательном и конфликтном взаимодействии с ИИ. Это самый противоречивый паттерн, для которого характерно колебание между крайностями: от полного восхищения и сверхзависимости до резкого отвержения и обесценивания. Подобный стиль отражает глубокий внутренний конфликт - одновременное желание получить поддержку от технологии и страх быть обманутым ею. Человек с дезорганизованной привязанностью постоянно нарушает собственные границы: он то чрезмерно полагается на ИИ в принятии важных решений, то вдруг начинает воспринимать его как угрозу. Технология становится не инструментом, а

экраном для проекции самых сильных и неразрешенных внутренних противоречий, что лишь усиливает чувство неуверенности и тревоги.

В. *Трансформация идентичности.* С появлением технологий, непрерывно сопровождающих человека на протяжении всей его жизни, границы самосознания человека неумолимо размываются. В контексте активного взаимодействия с ИИ происходит в том числе и глубокое психологическое расширение границ «Я».

Как показывают исследования [4], технологии, включаясь в повседневные практики, становятся частью телесного и психического опыта человека. Этот процесс ведет к тому, что ИИ начинает восприниматься не как внешний инструмент, а как продолжение собственных возможностей – своего рода «внешний психический орган». Однако такое расширение сопровождается размыванием границ между «Я» и «не-Я», что может приводить к утрате приватности, иллюзии контроля и росту зависимости от технологий. В результате возникает риск диффузии идентичности, когда внутренние опоры саморепрезентаций подменяются внешними, алгоритмическими подсказками. Следовательно, сохранение целостности самоидентичности в эпоху ИИ требует не только технологической грамотности, но и развитой рефлексивной позиции, позволяющей отличать собственные потребности и ценности от навязанных технологией паттернов поведения.

Следует отметить, что современный человек все чаще оказывается в ситуации, где его повседневная жизнь, коммуникация, профессиональная деятельность и даже глубоко личностные переживания опосредованы технологиями ИИ. Это создаёт новую культурно-историческую реальность, которая, подобно другим социальным трансформациям, оказывает влияние на структуру и содержание самоидентичности. Человек начинает воспринимать свои когнитивные и творческие возможности как неразрывно связанные с возможностями ИИ, что нарушает целостность и ясность границ между «Я» и «не-Я». Это может приводить к расширению самоидентичности за счет включения в образ «Я» технологических инструментов. В результате чего возникает феномен гибридной идентичности, где естественное и искусственное не взаимодополняют друг друга.

С одной стороны, ИИ помогает человеку лучше понять свои паттерны поведения, предпочтения и даже неосознаваемые мотивы, способствуя рефлексии и углублению самопознания, с другой – делегирование важных решений алгоритмам может вести к ослаблению чувства авторства своей жизни, что является ключевым атрибутом зрелой самоидентичности.

Поэтому даже такая психологическая структура как самоидентичность, влияющая на все сферы деятельности человека и на профессиональную в том числе, может пострадать при регулярном использовании ИИ без достаточной рефлексивности субъекта и четкого разграничения своих границ и способностей от способностей ИИ.

Таким образом, массовое внедрение технологий ИИ представляет собой не только технологический сдвиг, но и предвещает масштабные психологические изменения, которые требуют внимательного рассмотрения и дальнейшего изучения. В этой связи психогигиена перестаёт быть лишь частью личного благополучия и трансформируется в критически важный профессиональный навык, необходимый для сохранения автономии и психического здоровья. Ее практика позволяет осознанно выстраивать границы с технологиями, сохраняя активную позицию и осознавая собственную ответственность в полной мере. Дальнейшие исследования в данной области должны быть направлены на разработку конкретных методик и тренингов по развитию психогигиенических компетенций для различных профессиональных групп.

Использованные источники:

1. Залевский Г.В., Кузьмина Ю.В. Психогигиена в контексте психологии здоровья: краткая история, задачи и проблемы // Сибирский психологический журнал, 2012, №45, с. 32-38.
2. Гуляева Т.А., Стоянова Е.И. Исследование защитных механизмов студентов специальности клиническая психология / Психологическое здоровье человека: жизненный ресурс и жизненный потенциал: материалы конференции / Под ред. И.О. Логинова. Красноярск: Красноярский государственный медицинский университет имени профессора В.Ф. Войно-Ясенецкого, 2015. С. 296-298.
3. Лурия А.Р. Основы нейропсихологии. М.: Издательский центр Академия, 2013. 384 с.
4. Рассказова Е.И., Емелин В.А., Тхостов А.Ш. Диагностика психологических последствий влияния информационных технологий на человека. М.: Акрополь, 2015. 115 с.
5. Субботский Е.В. Мир волшебного как стимулятор креативности у детей // Воспитание и обучение детей младшего возраста, 2013, № 1, с. 89.
6. Гиберманн И. Между нами терапия. Исследование себя и ценности бессознательного. Москва; Манн, Иванов и Фербер (МИФ), 2025. 412 с.

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НАУЧНОЕ ОБОСНОВАНИЕ СОДЕРЖАНИЯ БОЕВОЙ И ФИЗИЧЕСКОЙ ПОДГОТОВКИ СОТРУДНИКОВ ПРАВООХРАНИТЕЛЬНЫХ ОРГАНОВ ПРИ ЗАДЕРЖАНИИ ПОДОЗРЕВАЕМЫХ

Аннотация: В статье рассматриваются вопросы научного обоснования содержания боевой и физической подготовки сотрудников правоохранительных органов при задержании подозреваемых в условиях служебно-боевой деятельности. Актуальность исследования обусловлена необходимостью повышения эффективности противодействия преступности и обеспечения личной безопасности сотрудников органов внутренних дел Республики Узбекистан. В работе проанализированы нормативно-правовые документы и научные источники, регламентирующие физическую и боевую подготовку сотрудников. Использованы методы анализа литературы и нормативных актов, а также педагогический анализ. Результаты исследования показали, что комплексное развитие физических качеств и формирование прикладных навыков самообороны и силового задержания являются важнейшими условиями профессиональной готовности сотрудников. Материалы статьи могут быть использованы при совершенствовании программ боевой и физической подготовки в системе МВД Республики Узбекистан.

Ключевые слова: боевая подготовка, физическая подготовка, задержание подозреваемых, самооборона, противодействие преступности, служебно-боевая деятельность, органы внутренних дел.

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SCIENTIFIC BASIS FOR THE CONTENT OF COMBAT AND PHYSICAL TRAINING FOR LAW ENFORCEMENT OFFICERS DURING THE ARREST OF SUSPECTS

Abstract: The article examines the scientific substantiation of the content of combat and physical training of law enforcement officers during the detention of suspects in the context of operational and service activities. The relevance of the study is determined by the need to increase the effectiveness of crime counteraction and ensure the personal safety of officers of the internal affairs bodies of the

Republic of Uzbekistan. The paper analyzes regulatory legal acts and scientific sources governing physical and combat training. Methods of literature review, analysis of normative documents, and pedagogical analysis were applied. The results show that the comprehensive development of physical qualities and the formation of applied self-defense and forceful detention skills are key conditions for professional readiness. The materials of the article can be used to improve combat and physical training programs in the system of the Ministry of Internal Affairs of the Republic of Uzbekistan.

Keywords: *combat training, physical training, detention of suspects, self-defense, crime counteraction, operational and service activities, internal affairs bodies.*

Введение

В современных условиях служебно-боевой деятельности сотрудников правоохранительных органов Республики Узбекистан обеспечение высокой эффективности физической и боевой подготовки является ключевым фактором успешного выполнения задач по задержанию подозреваемых, противодействию преступности и обеспечению общественной безопасности. Уровень физической и боевой подготовленности определяет способность сотрудников действовать результативно и безопасно в условиях динамичных и опасных служебно-боевых ситуаций.

Государственная политика Республики Узбекистан в области развития физической культуры, спорта и укрепления здоровья населения направлена на формирование у граждан, в том числе сотрудников правоохранительных органов, высоких физических качеств и устойчивых навыков служебной подготовки. Так, Постановление Президента Республики Узбекистан № ПП-3031 от 3 июня 2017 г. «О мерах по дальнейшему развитию физической культуры и массового спорта» подчёркивает задачи широкого вовлечения населения к регулярным занятиям физической культурой, укрепление мужества, силы характера и здоровья, что является фундаментом для формирования у будущих и действующих сотрудников правоохранительных органов необходимых физических качеств и психофизиологической устойчивости [1].

Помимо этого, на системные изменения в сторону укрепления здоровья и физической активности обращают внимание и более поздние инициативы. Например, указ Президента Республики Узбекистан предусматривает ежедневные физические упражнения как обязательную практику для государственных служащих, направленные на повышение уровня физической активности работников государственных учреждений, что косвенно влияет и на сотрудников правоохранительных структур в рамках общей государственной политики укрепления здоровья и готовности к служебным обязанностям [2].

В правоприменительной практике особое внимание уделяется также сохранению здорового образа жизни среди государственных служащих,

включая регулярное выполнение продуктивной гимнастики и участие в спортивных мероприятиях, что соответствует комплексному подходу к физической подготовке сотрудников, выполняющих ответственные служебные задачи по обеспечению правопорядка.

Таким образом, законодательные акты и постановления Президента Республики Узбекистан создают нормативную основу для формирования системы физической и боевой подготовки, направленной на развитие необходимых профессионально-важных качеств сотрудников правоохранительных органов, что обосновывает актуальность данного исследования.

Методы

Для проведения исследования применялись следующие методы:

1. Анализ нормативно-правовой базы: изучение законов Республики Узбекистан, регулирующих служебно-боевую подготовку и порядок применения физической силы при задержании подозреваемых [3].

2. Контент-анализ научных публикаций: систематизация отечественной научной литературы по физической подготовке сотрудников МВД (например, исследования развития физической подготовки), опубликованной в открытых журналах [4].

3. Метод сравнительного анализа: сопоставление подходов к физической подготовке сотрудников органов внутренних дел внутри Узбекистана и в международной практике (например, в РФ и других странах)[5].

4. Педагогический анализ программ обучения: оценка содержания образовательных программ по боевой и физической подготовке курсантов учебных заведений МВД Республики Узбекистан.

Результаты

Системность физической подготовки: Научные исследования показывают, что физическая и боевая подготовка сотрудников внутренних дел направлена на формирование базовых физических качеств (силы, выносливости, скорости), необходимых для выполнения служебно-боевых задач, включая задержание подозреваемых[4].

Современные подходы и инновации: В ряде исследований рассматривается использование современных тренировочных методик, таких как CrossFit, для повышения уровня физической подготовленности сотрудников МВД [5].

Контроль качества подготовки: Публикации из Узбекистана указывают на важность комплексного контроля физической и боевой подготовки курсантов в образовательных учреждениях МВД, что способствует формированию профессионально-важных качеств.

Законодательная основа применения физической силы: Закон Республики Узбекистан «Об органах внутренних дел» прямо предусматривает право сотрудников применять физическую силу и боевые приёмы борьбы при

задержании подозреваемых, что подчёркивает значимость подготовки в данной области [3].

Обсуждение

Полученные результаты подтверждают, что эффективность работы сотрудников правоохранительных органов во многом зависит от уровня их физической и боевой подготовки. Это согласуется с международными исследованиями, которые подчёркивают необходимость регулярной тренировки физических качеств и специальных навыков бокса, борьбы или силового задержания для успешного противоборства преступности [5].

В Узбекистане наблюдается тенденция к интеграции прикладных тренировочных методик в образовательный процесс высших учебных заведений МВД, что создаёт условия для подготовки кадров, способных эффективно действовать в экстремальных ситуациях служебно-боевой деятельности.

Однако анализ литературы выявляет недостаточную научную разработанность ряда аспектов, таких как оптимальные параметры тренировочных программ и критерии оценки эффективности прикладной подготовки, что представляет направление для будущих исследований [7].

Заключение

Эффективная физическая и боевая подготовка сотрудников органов внутренних дел Республики Узбекистан является критически важной для безопасного и результативного задержания подозреваемых в условиях служебно-боевой деятельности.

Законодательная база обеспечивает правовой фундамент для применения физической силы, включая боевые приёмы борьбы, что требует соответствующей подготовки сотрудников.

Текущие подходы к боевой и физической подготовке в Узбекистане разнообразны, включают современные тренировочные методики и системный контроль, однако требуют дальнейшей научной доработки.

Использованные источники:

1. Постановление Президента Республики Узбекистан № ПП-3031 от 3 июня 2017 г. «О мерах по дальнейшему развитию физической культуры и массового спорта».
2. Питер Рудик. Узбекистан: Реформа государственной службы способствует повышению профессионализма и требует от государственных служащих здорового образа жизни. // The Library of Congress, 2026.
3. Закон Республики Узбекистан № ЗРУ-407 «Об органах внутренних дел» от 16.09.2016 г.
4. Gapparov H.Z., Ahmedov H.R. Features Of the Development of Physical Abilities Law Enforcement Staff. // Eurasian Journal of Humanities and Social Sciences, №5, 2022. P-64-66.
5. Журабоев М.Т. Сравнительный анализ физической подготовки сотрудников МВД разных стран . // Tadqiqotlar, 68(1), (2025), с-234-238.

6. Mirzakulov A.G. The Use of CrossFit in the Physical Training of Law Enforcement Officers. // PEDAGOGS, 2024. P-116-121.
7. Бутаев И.Н. Формы организации учебных занятий по физической и боевой подготовки курсантов. // «Physical education and sports: problems, prospects, innovations. International scientific congress, 2023. p-126-128.

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ФУНКЦИЯ ПЕЧЕНИ, РОЛЬ МИТОХОНДРИЙ В БИОЭНЕРГЕТИКЕ КЛЕТОК ПЕЧЕНИ

Аннотация: Печень является центральным метаболическим органом человека, обеспечивающий регуляцию углеводного, липидного, белкового и энергетического обмена, а также процессы детоксикации, биотрансформации ксенобиотиков и поддержания гомеостаза внутренней среды. Эффективное выполнение этих многообразных функций невозможно без адекватного энергетического обеспечения, ключевую роль в котором играют митохондрии гепатоцитов. Митохондрии печени представляют собой высокоспециализированные органеллы, участвующие не только в синтезе аденозинтрифосфата, посредством окислительного фосфорилирования, но и в регуляции апоптоза, метаболизма жирных кислот, аминокислот и реактивных форм кислорода. Целью настоящей научной статьи является комплексный анализ функций печени и теоретическое обоснование роли митохондрий в энергетике печёночных клеток с позиций современной клеточной биологии, биохимии и патофизиологии. В статье рассматриваются структурно-функциональные особенности митохондрий гепатоцитов, механизмы митохондриального энергообразования, а также их значение в нормальных и патологических состояниях печени. Работа основана на анализе современных научных данных и предназначена для специалистов в области медицины, биологии и биомедицинских наук.

Ключевые слова: Печень; гепатоциты; митохондрии; энергетический обмен; окислительное фосфорилирование; АТФ; клеточный метаболизм; митохондриальная дисфункция.

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LIVER FUNCTION, THE ROLE OF MITOCHONDRIA IN LIVER CELL BIOENERGETICS

Abstract: *The liver is a central metabolic organ in humans, regulating carbohydrate, lipid, protein, and energy metabolism, as well as detoxification processes, xenobiotic biotransformation, and maintaining internal homeostasis. Effective performance of these diverse functions is impossible without adequate energy supply, in which hepatocyte mitochondria play a key role. Liver mitochondria are highly specialized organelles involved not only in the synthesis of adenosine triphosphate via oxidative phosphorylation but also in the regulation of apoptosis, fatty acid metabolism, amino acid metabolism, and reactive oxygen species. The aim of this scientific article is to comprehensively analyze liver function and theoretically substantiate the role of mitochondria in liver cell energetics from the perspective of modern cell biology, biochemistry, and pathophysiology. This article examines the structural and functional characteristics of hepatocyte mitochondria, the mechanisms of mitochondrial energy production, and their importance in normal and pathological liver conditions. This work is based on an analysis of current scientific data and is intended for specialists in medicine, biology, and biomedical sciences.*

Keywords: *Liver; hepatocytes; mitochondria; energy metabolism; oxidative phosphorylation; ATP; cellular metabolism; mitochondrial dysfunction.*

Введение. Печень занимает особое место среди органов человека благодаря своей универсальной роли в обеспечении метаболической стабильности организма и способности адаптироваться к изменяющимся физиологическим и патологическим условиям, что делает её ключевой частью системной регуляции обменных процессов. Гепатоциты, составляющие основную массу печёночной паренхимы, выполняют широкий спектр функций, включая синтез и депонирование гликогена, регуляцию липидного и белкового обмена, образование желчи, инактивацию токсических соединений и участие в иммунных реакциях. Реализация этих функций требует значительных энергетических затрат, что обуславливает высокую плотность митохондрий в цитоплазме гепатоцитов и их исключительную функциональную активность. В последние десятилетия митохондрии перестали рассматриваться исключительно как «энергетические станции» клетки; современные исследования показали, что они играют центральную роль в регуляции клеточной сигнализации, окислительно-восстановительного баланса, программируемой клеточной гибели и адаптационных реакций печени [1.3.5].

Особый научный и клинический интерес представляет изучение роли митохондрий в патогенезе заболеваний печени, поскольку митохондриальная дисфункция рассматривается как один из ключевых механизмов развития жировой болезни печени, алкогольного и неалкогольного стеатогепатита, фиброза и цирроза. Нарушения митохондриального дыхания, снижение синтеза АТФ и избыточное образование реактивных форм кислорода приводят к энергетическому дефициту гепатоцитов и активации патологических каскадов, усугубляющих повреждение печёночной ткани. В

этом контексте анализ функций печени в неразрывной связи с митохондриальной энергетикой приобретает особую актуальность, поскольку позволяет глубже понять фундаментальные механизмы печёночной физиологии и патофизиологии. Данная статья направлена на систематизацию современных представлений о функциях печени и роли митохондрий в энергетическом обеспечении гепатоцитов, что имеет важное значение для развития новых диагностических и терапевтических подходов в гепатологии [2.6.8].

Материалы и методы. Данная научная статья выполнена в формате теоретико-аналитического исследования, направленного на комплексное изучение функций печени и роли митохондрий в энергетическом обеспечении гепатоцитов на основе современных представлений клеточной биологии, биохимии и молекулярной медицины. Методологической основой работы послужил системный подход, позволяющий рассматривать печень как интегрированный метаболический орган, а митохондрии — как ключевой функциональный элемент энергетического и регуляторного обеспечения печёночных клеток. В ходе исследования был проведён углублённый анализ национальных и зарубежных научных источников, включающих монографии, обзорные и оригинальные статьи, клинические рекомендации и фундаментальные экспериментальные исследования, опубликованные преимущественно в период с 1995 по 2024 год в рецензируемых научных изданиях. Основными информационными базами послужили PubMed, Scopus, Web of Science, eLibrary и Google Scholar, что обеспечило репрезентативность и актуальность отобранного материала. При отборе источников использовались ключевые слова и их комбинации, отражающие основные аспекты исследуемой проблемы, такие как «функции печени», «митохондрии гепатоцитов», «энергетический обмен», «окислительное фосфорилирование», «митохондриальная дисфункция» и «заболевания печени» [4.7.9.10].

В качестве основных методов исследования применялись теоретический анализ, сравнительно-аналитический метод, структурно-функциональный анализ и научное обобщение. Теоретический анализ позволил рассмотреть эволюцию представлений о функциях печени и митохондрий, а также выявить ключевые концепции, определяющие современное понимание энергетики гепатоцитов. Сравнительно-аналитический метод использовался для сопоставления физиологических и патологических состояний печени с точки зрения митохондриальной активности и энергетического метаболизма. Структурно-функциональный анализ был направлен на изучение взаимосвязи между ультраструктурными особенностями митохондрий гепатоцитов и их функциональной нагрузкой в процессах синтеза АТФ, β -окисления жирных кислот и регуляции апоптоза. Метод научного обобщения применялся для систематизации полученных данных и формулирования обоснованных выводов о роли митохондрий в энергетическом обеспечении печени. Поскольку работа носит обзорно-теоретический характер и не предполагает проведения экспериментальных

исследований с участием человека или животных, вопросы биоэтики и информированного согласия не затрагивались; при этом строго соблюдались принципы академической добросовестности и корректного цитирования источников. Применение данной методологии позволило сформировать целостное и логически выверенное представление о функциях печени и митохондриальной энергетике гепатоцитов, соответствующее современному уровню научных знаний.

Результаты. Анализ современной научной данной позволило установить, что функциональная активность печени напрямую зависит от состояния и метаболической эффективности митохондрий гепатоцитов, которые обеспечивают энергетическую основу практически всех биохимических и физиологических процессов, протекающих в данном органе. В нормальных условиях митохондрии печени характеризуются высокой плотностью, развитой кристалльной структурой и значительной функциональной пластичностью, что позволяет им адаптироваться к изменяющимся метаболическим нагрузкам, связанным с приёмом пищи, детоксикацией, гормональной регуляцией и стрессовыми воздействиями. Основным результатом митохондриальной активности является синтез аденозинтрифосфата в процессе окислительного фосфорилирования, осуществляемого дыхательной цепью, локализованной на внутренней мембране митохондрий, при этом в гепатоцитах данный процесс тесно сопряжён с β -окислением жирных кислот, окислением пирувата и аминокислот, а также функционированием цикла трикарбоновых кислот. Полученные теоретические данные свидетельствуют о том, что до 90% энергетических потребностей печени покрываются за счёт митохондриального синтеза АТФ, что подчёркивает их ключевую роль в поддержании энергетического гомеостаза органа.

Результаты анализа также показывают, что митохондрии печени участвуют не только в энергообразовании, но и в регуляции метаболических потоков, определяющих функциональное состояние гепатоцитов, включая глюконеогенез, кетогенез, синтез холестерина и желчных кислот. Особое значение имеет участие митохондрий в регуляции окислительно-восстановительного баланса, поскольку образование реактивных форм кислорода является неизбежным следствием митохондриального дыхания, а адекватная работа антиоксидантных систем обеспечивает защиту клеточных структур от окислительного повреждения. При нарушении митохондриальной функции, что подтверждается данными экспериментальных и клинических исследований, наблюдается снижение активности дыхательной цепи, уменьшение продукции АТФ и накопление недоокисленных метаболитов, что приводит к энергетическому дефициту гепатоцитов и нарушению их специализированных функций. Такие изменения рассматриваются как ранние патогенетические механизмы развития метаболических и воспалительных заболеваний печени, включая

неалкогольную жировую болезнь печени, алкогольное поражение печени и лекарственно-индуцированные гепатопатии.

Дополнительно установлено, что митохондрии играют важную роль в регуляции программируемой клеточной гибели гепатоцитов, выступая ключевой частью в запуске митохондриального пути апоптоза через высвобождение цитохрома с и активацию каспазного каскада. В условиях хронического повреждения печени митохондриальная дисфункция способствует активации апоптоза и некроза, что приводит к потере функциональной массы гепатоцитов и прогрессирование фиброза. Совокупность полученных результатов позволяет сделать вывод о том, что митохондрии являются неотъемлемым структурно-функциональным компонентом печени, определяющим её энергетическую состоятельность, метаболическую гибкость и устойчивость к повреждающим факторам, а нарушения митохондриальной энергетики лежат в основе многих патологических процессов, развивающихся в печени.

Обсуждение. Полученные в ходе теоретического анализа данные подтверждают, что печень является не просто метаболическим органом, а высокоорганизованной биологической системой, функциональная состоятельность которой в решающей степени определяется состоянием митохондриального аппарата гепатоцитов. Обсуждение роли митохондрий в энергетике печени позволяет рассматривать их как центральный интегративный элемент, связывающий процессы энергообразования, метаболической регуляции и клеточной выживаемости. Современные представления о митохондриях существенно расширились по сравнению с классической концепцией «энергетических станций» клетки, поскольку установлено, что они участвуют в регуляции внутриклеточной сигнализации, контроле окислительно-восстановительного гомеостаза и запуске программируемой клеточной гибели. В контексте печени это приобретает особое значение, так как гепатоциты ежедневно подвергаются воздействию большого количества эндогенных и экзогенных факторов, требующих значительных энергетических затрат и высокой адаптационной способности митохондрий.

Обсуждение результатов также показывает, что митохондриальная дисфункция может рассматриваться как универсальный патогенетический механизм большинства хронических заболеваний печени, независимо от их этиологии. Снижение эффективности окислительного фосфорилирования, накопление реактивных форм кислорода и нарушение митохондриальной динамики приводят к энергетическому истощению гепатоцитов, активации воспалительных и фиброгенных каскадов и прогрессированию структурных повреждений печёночной ткани. В этом аспекте митохондрии выступают не только мишенью повреждающих факторов, но и активным участником патологического процесса, определяющим тяжесть и скорость развития заболевания. Анализ современных научных данных свидетельствует о том, что восстановление митохондриальной функции и поддержание

энергетического баланса гепатоцитов рассматриваются как перспективные направления в разработке новых терапевтических стратегий в гепатологии. Таким образом, обсуждение подчёркивает необходимость интегративного подхода к изучению функций печени, в рамках которого митохондриальная энергетика занимает ключевое место.

Заключение. Печень является центральным органом метаболической регуляции, функционирование которого невозможно без адекватного энергетического обеспечения, осуществляемого митохондриями гепатоцитов. В данной научной статье показано, что митохондрии играют определяющую роль в поддержании энергетического гомеостаза печени, обеспечивая синтез АТФ, регуляцию метаболических путей и адаптацию гепатоцитов к физиологическим и патологическим нагрузкам. Наряду с этим митохондрии участвуют в контроле окислительно-восстановительного баланса и механизмов программируемой клеточной гибели, что делает их ключевым элементом как нормальной функции печени, так и патогенеза её заболеваний. В заключение следует отметить, что углублённое понимание роли митохондрий в энергетике печени открывает новые возможности для разработки диагностических и терапевтических подходов, направленных на профилактику и лечение заболеваний печени. Полученные теоретические выводы могут служить основой для дальнейших экспериментальных и клинических исследований, ориентированных на митохондриально-ориентированную терапию в современной гепатологии.

Использованные источники:

1. Alberts B., Johnson A., Lewis J., et al. *Molecular Biology of the Cell*. 6th ed. New York: Garland Science; 2015.
2. Friedman JR, Nunnari J. Mitochondrial form and function. *Nature*. 2014;505(7483):335–343.
3. Wallace DC. Mitochondria and bioenergetics in disease. *N Engl J Med*. 2012;366(21):1937–1948.
4. Begriche K., Massart J., Robin MA., et al. Mitochondrial adaptations and dysfunctions in nonalcoholic fatty liver disease. *Hepatology*. 2013;58(4):1497–1507.
5. Pessayre D., Fromenty B. NASH: a mitochondrial disease. *J Hepatol*. 2005;42(6):928–940.
6. Sies H. Oxidative stress: a concept in redox biology and medicine. *Redox Biol*. 2015;4:180–183.
7. Scatena R., Bottoni P., Pontoglio A., Giardina B. Mitochondrial dysfunction in liver disease. *J Bioenerg Biomembr*. 2007;39(1):87–97.
8. Begriche K., Igoudjil A., Pessayre D., Fromenty B. Mitochondrial dysfunction in NASH: causes, consequences and possible means to prevent it. *Mitochondrion*. 2006;6(1):1–28.
9. Zoratti M., Szabò I. The mitochondrial permeability transition. *Biochim Biophys Acta*. 1995;1241(2):139–176.

10. Boveris A., Navarro A. Brain mitochondrial dysfunction in aging. IUBMB Life. 2008;60(5):308–314.
11. Турдиева О.М., Позилов М.К., Абдуллажонова Н.Г. Токсик гепатитда каламуш жигар гомогенатидаги антиоксидант ферментлар фаоллигига госситан ва гетасаннинг таъсири // Инфекция, Иммуниет и Фармакология – 2021 – №.5. – В. 242-250.
12. Турдиева О.М., Позилов М.К., Абдуллажонова Н.Г. Токсик гепатитда госситан ва гетасаннинг жигар митохондриясининг порасига таъсири // Наманган давлат университети Илмий ахборотномаси – 2021 – №10 – В.163-167.
13. Turdieva O.M. Effects of gossitan and getasan on lipid peroxidation and high-permeability pore of liver mitochondria intoxic hepatitis // The Seybold report – 2023 – V.18 №5 – P.1885-1892.

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МОДЕЛЬ РАЗВИТИЯ ПРОФЕССИОНАЛЬНОЙ КОМПЕТЕНТНОСТИ СТУДЕНТОВ НА ОСНОВЕ ТЕХНОЛОГИИ SCRIBING

Аннотация: В статье рассматривается технология scribing (визуальная запись) как современный инструмент визуализации информации, значительно повышающий эффективность образовательного процесса и профессиональной деятельности. Целью исследования является разработка модели развития профессиональной компетентности студентов на основе применения технологии scribing как инновационного инструмента визуализации знаний. В условиях цифровой трансформации сферы образования актуальным становится поиск методов, способных одновременно повышать мотивацию обучающихся, развивать их критическое мышление и формировать ключевые профессиональные навыки.

Методология исследования опирается на комплексный подход, включающий анализ педагогической литературы, сравнительный обзор практик визуализации в образовании, а также проведение экспериментальной работы со студентами. Использовались методы наблюдения, анкетирования, анализа учебных достижений и проектной деятельности. Особое внимание уделялось интеграции scribing в учебный процесс и оценке его влияния на формирование компетенций.

Результаты показали, что применение scribing способствует более глубокому усвоению материала, развитию навыков структурирования информации и повышению уровня самостоятельности студентов. Предложенная модель включает четыре этапа: подготовительный, учебный, практический и рефлексивный, каждый из которых направлен на последовательное формирование информационной, коммуникативной и творческой компетентности. Возможности применения результатов заключаются в адаптации модели для различных дисциплин и образовательных программ, а также в использовании её при проектной и исследовательской деятельности.

Практическая значимость работы состоит в том, что предложенная модель может быть внедрена в образовательные учреждения для повышения качества подготовки специалистов. Она обеспечивает развитие у студентов навыков визуального мышления, коммуникации и креативности, что востребовано в условиях цифровой экономики и междисциплинарного взаимодействия.

Ценность исследования определяется его ориентацией на целевую группу — студентов вузов, новизной предложенной модели и её международным значением. Scribing как универсальная технология визуализации может быть успешно интегрирована в образовательные практики разных стран, способствуя формированию глобально конкурентоспособных специалистов.

Таким образом, статья демонстрирует, что scribing является эффективной педагогической технологией, повышающей качество обучения, усиливающей визуальную грамотность и формирующей профессиональные компетенции будущих специалистов.

Ключевые слова: *scribing, визуальная запись, образовательные технологии, критическое мышление, цифровой скрайб-конспект, визуализация информации, профессиональная компетентность.*

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A MODEL FOR THE DEVELOPMENT OF STUDENTS' PROFESSIONAL COMPETENCE BASED ON SCRIBING TECHNOLOGY

Abstract: *This article examines scribing technology (visual recording) as a modern information visualization tool that significantly improves the effectiveness of the educational process and professional activities. The aim of the study is to develop a model for developing students' professional competence using scribing technology as an innovative knowledge visualization tool. In the context of the digital transformation of education, the search for methods capable of simultaneously increasing student motivation, developing their critical thinking, and shaping key professional skills has become increasingly important.*

The research methodology relies on a comprehensive approach, including an analysis of pedagogical literature, a comparative review of visualization practices in education, and experimental work with students. Methods used included observation, questionnaires, analysis of academic achievements, and project-based activities. Particular attention was paid to integrating scribing into the educational process and assessing its impact on competency development.

The results showed that scribing facilitates deeper learning, develops information structuring skills, and increases students' independence. The proposed model includes four stages: preparatory, educational, practical, and reflective, each aimed at sequentially developing informational, communicative, and creative competencies. Potential applications of the results include adapting the model to

various disciplines and educational programs, as well as using it in project-based and research activities.

The practical significance of this work lies in the fact that the proposed model can be implemented in educational institutions to improve the quality of specialist training. It helps students develop visual thinking, communication, and creativity skills, which are in demand in the digital economy and interdisciplinary collaboration.

The value of this study is determined by its focus on the target group—university students—the novelty of the proposed model, and its international significance. Scribing, as a universal visualization technology, can be successfully integrated into educational practices across countries, contributing to the development of globally competitive professionals.

Thus, the article demonstrates that scribing is an effective pedagogical technology that improves the quality of learning, enhances visual literacy, and develops the professional competencies of future professionals.

Keywords: *scribing, visual recording, educational technologies, critical thinking, digital scribing, information visualization, professional competence.*

1. Введение

Современная система образования переживает период стремительных изменений, обусловленных интенсивным развитием цифровых технологий и повышением требований к качеству подготовки специалистов. Цифровая трансформация затрагивает все элементы образовательного процесса: от методов преподавания и коммуникации до форм представления учебной информации и оценки результатов обучения. Интерактивные платформы, мультимедийные средства, онлайн-курсы и интеллектуальные системы поддержки обучения становятся неотъемлемой частью учебной среды, обеспечивая более гибкие, доступные и персонализированные условия для получения знаний. [1, 2]

В этих условиях возрастает необходимость внедрения таких педагогических подходов, которые не только соответствуют цифровой эпохе, но и позволяют эффективно развивать профессиональные компетенции студентов. Одним из таких подходов является визуализация информации, играющая ключевую роль в повышении качества восприятия и осмысления учебного материала. [3, 4] Наиболее ярким и современным инструментом визуализации выступает технология scribing, которая объединяет графические элементы, ключевые понятия и логические связи в единую наглядную структуру.

Слово scribing происходит от английского «to scribe» — «писать, чертить». Первоначально скрайбинг означал визуальное сопровождение речи: человек рисовал простые схемы и образы, пока говорил. Scribing возник как инструмент визуальной коммуникации в бизнесе и презентациях в конце XX – начале XXI века. Целью было сделать сложные идеи понятными и удержать

внимание аудитории. [5] Постепенно (в 2010-е годы) он перешёл в сферу образования, где стал использоваться для упрощения подачи материала, развития критического мышления и вовлечения студентов.

Scribing – это способ визуализации информации, когда речь параллельно дополняется рисунками, иконками, схемами и инфографикой. Целью данного способа визуализации является упрощение восприятия сложных тем и пробуждение мотивации к получению подающейся информации. В результате активизируется визуальное мышление и развиваются творческие способности. [6]

В современном мире scribing интегрируется в цифровые технологии: интерактивные доски, планшеты, онлайн-курсы и играет значительную роль во многих сферах человеческой жизни, включая как образование, так и бизнес, медиа и другие области. [7] Scribing используется для создания диаграмм, интеллект-карт и других визуальных инструментов, которые помогают в анализе данных и планировании проектов. Визуальные записи способствуют коллективному обсуждению и генерации идей, стимулируя креативность и совместную работу.

Сегодня scribing – это инновационная педагогическая технология, которая делает обучение более наглядным и интерактивным. Особенно он полезен для дисциплин, где важна систематизация информации и развитие креативности. [8] Scribing активизирует оба полушария мозга – логическое и образное. Это способствует лучшему запоминанию, развитию креативности и критического мышления. [1]

Использование визуальных записей на лекциях и различных занятиях делает занятия более интерактивными и увлекательными, что повышает активность и вовлеченность студентов. Визуализация информации способствует лучшему пониманию и запоминанию. Визуальные элементы делают процесс обучения и работы более увлекательным и стимулирующим. Scribing адаптируется под различные когнитивные стили, делая информацию доступной для всех. [9]

В образовательных учреждениях преподаватели могут использовать scribing для создания визуальных конспектов и схем во время изложения материала. В целом, scribing является мощным инструментом, который может значительно улучшить когнитивные функции студентов, делая процесс обучения более эффективным и увлекательным. Использование визуальных записей для выделения ключевых моментов и структурирования информации, создание совместных визуальных записей для анализа и обсуждения тем, визуализация шагов решения задач и проблем и создание визуальных резюме и обзоров пройденного материала для лучшего запоминания, и понимания эти все этапы проведения занятий положительно влияют на когнитивные функции студентов, что способствует развитию профессиональной компетентности. [10, 11]

2. Материалы и методы

2.1. Основные элементы модели развития профессиональной компетентности студентов на основе технологии scribing

Компетенция рассматривается как интегративное качество личности, объединяющее знания, умения и навыки, необходимые для успешной профессиональной деятельности. Профессиональная компетентность студентов, в свою очередь, выражается в способности применять эти знания и умения в реальных условиях, обеспечивая эффективность и качество работы. [12, 13]

Модель развития профессиональной компетентности студентов на основе технологии scribing строится вокруг визуализации знаний, формирования критического мышления и развития самостоятельности. Она предполагает использование графических схем, рисунков и иконок для систематизации информации, что усиливает мотивацию, творческие способности и профессиональные навыки будущих специалистов.

Scribing позволяет переводить сложные понятия в наглядные схемы, рисунки и инфографику. Это облегчает понимание материала. [14]

К основным когнитивным функциям [15], которые улучшаются при использовании технологии scribing отнесем:

1. Вниманье, т.е. фокусировка. Визуальные элементы привлекают и удерживают внимание студентов, помогая им сосредоточиться на ключевых моментах лекции или учебного материала. Scribing помогает студентам выделять важную информацию и игнорировать второстепенные детали, что способствует более эффективному обучению и развитию селективного внимания.

2. Память. Визуальные образы и схемы способствуют более прочному закреплению информации в долговременной памяти за счет ассоциативного мышления и создания ментальных образов, т.е. абстракции элементов.

3. Понимание, синтез информации. Scribing помогает студентам объединять и структурировать информацию из разных источников, что способствует более глубокому пониманию материала. Визуализация способствует интеграции новых знаний с уже имеющимися, помогая студентам создавать целостную картину изучаемого предмета.

4. Анализ и критическое мышление. Создание визуальных записей требует анализа и структурирования информации, что развивает аналитическое мышление. Scribing стимулирует студентов задавать вопросы, проверять гипотезы и критически оценивать информацию, способствуя развитию критического мышления.

5. Решение проблем, осуществляется развитием проблемно-ориентированного и креативного мышления. Визуальные записи помогают студентам разбивать сложные проблемы на более простые элементы и искать решения, что способствует развитию навыков решения проблем. Scribing поощряет студентов использовать креативные подходы и искать нестандартные решения, развивая творческое мышление.

6. Коммуникация и совместная работа. Scribing помогает студентам

лучше выражать свои мысли и идеи через визуальные образы, что улучшает их навыки коммуникации. Создание совместных визуальных записей способствует развитию навыков командной работы и сотрудничества.

7. Мета-когнитивные навыки [16, 17, 18]. Визуальные записи помогают студентам отслеживать свой прогресс и понимать, как они усваивают материал, что способствует развитию мета-когнитивных навыков. Scribing помогает студентам разрабатывать и использовать эффективные стратегии обучения, такие как структурирование информации и создание абстракций.

При создании скрайб-конспектов студент учится выделять главное, структурировать информацию и формулировать выводы. Применяя данную технологию у студентов формируется профессиональная компетентность. Наглядное представление формирования профессиональной компетентности указано на схематическом рисунке 1.



Рис.-1. Формирование профессиональной компетентности

Fig. 1. Formation of professional competence

При создании скрайб-конспектов у студентов развиваются умения работать с цифровыми ресурсами и устройствами, что приводит к формированию цифровой компетентности. После создания скрайб-конспекта студенту легко презентовать (рассказать) пройденную тему, в связи с чем формируется коммуникативная компетентность. Многократное создание скрайб-конспектов приводит к формированию творческой компетентности.

2.2. Структура модели развития профессиональной компетентности студентов на основе технологии scribing

Модель развития профессиональной компетентности студентов через scribing – это инновационная педагогическая технология, которая объединяет обучение, творчество и практику. Она помогает студентам лучше усваивать знания и формировать ключевые профессиональные навыки: работу с информацией, коммуникацию и самостоятельность.

Структура модели состоит из четырех этапов, и наглядно представлена в таблице 1.

Таблица 1. Четыре этапа развития профессиональной компетентности студентов на основе технологии scribing
 Table 1. Four stages of development of students' professional competence based on scribing technology

Этап	Содержание	Результат
Подготовительный	ознакомление студентов с технологией scribing, обучение базовым приёмам	базовые навыки визуализации
Учебный	применение scribing при изучении дисциплин (создание скрайб-конспекта)	освоение учебного материала через визуализацию
Практический	использование scribing для решения профессиональных задач (проектная работа, кейсы)	формирование профессиональных компетенций
Рефлексивный	анализ и оценка собственных работ, обсуждение в группе, саморефлексия	развитие критического мышления и самооценки

Таким образом, предложенная модель представляет собой поэтапный процесс формирования профессиональной компетентности студентов, где каждый этап выполняет свою функцию:

- подготовительный — обеспечивает базовые навыки работы с визуализацией;
- учебный — способствует более глубокому усвоению дисциплинарного материала;
- практический — формирует профессиональные умения и навыки через решение прикладных задач;
- рефлексивный — развивает способность к критическому анализу, самооценке и осознанию собственного профессионального роста.

Эта структура позволяет интегрировать технологию scribing в образовательный процесс не как отдельный методический приём, а как целостную педагогическую систему, направленную на развитие ключевых компетенций будущего специалиста.

Scribing является универсальной технологией, которая может эффективно применяться как в традиционных формах обучения, так и в нетрадиционных формах обучения, улучшая процесс усвоения информации, вовлеченность студентов и качество образовательного процесса.

3. Результаты

3.1. Разработка учебного занятия на тему «Облачные технологии» с интеграцией технологии scribing через интерактивную онлайн-доску Canva.

В рамках исследования была разработана и апробирована модель учебного занятия по дисциплине «Информатика и цифровые технологии» с использованием технологии scribing. Занятие включало этапы визуализации ключевых понятий, коллективного создания скрайб-конспекта и групповой

работы студентов. Результаты показали повышение мотивации, развитие навыков структурирования информации и формирование элементов профессиональной компетентности.

Учебное занятие ориентировано на студентов педагогических или ИТ-направлений и направлен на формирование не только знаний по теме, но и навыков визуализации информации.

Цель занятия: Формирование у студентов навыков визуализации информации и развитие профессиональной компетентности через использование технологии scribing.

Задачи занятия

Образовательные: изучить понятие, типы и преимущества облачных технологий; понять принципы работы облачных сервисов (Google Drive, OneDrive, Dropbox и др.).

Развивающие: развивать критическое мышление и навыки структурирования информации; формировать визуальную грамотность и умение представлять знания в наглядной форме.

Воспитательные: развивать цифровую культуру и умение работать в команде в онлайн-среде.

Продолжительность: 80 минут

Необходимое оборудование и ПО: компьютеры или ноутбуки с доступом в интернет; онлайн-доска Canva Whiteboard (<https://www.canva.com/whiteboards/>); аккаунты Canva (у преподавателя и студентов); google-таблица или форма для сбора ссылок на работы.

Форма занятия: интерактивное лекционное занятие с визуализацией и групповым проектом.

Ход занятия

I. Организационный момент (5 минут)

– Приветствие

– Актуализация знаний: вопрос «Что вы знаете об облачных технологиях?»

– Постановка цели: чему научимся, как будем работать (в Canva-доске)

II. Теоретическая часть (15 минут)

Лекция преподавателя с использованием Scribing на онлайн-доске Canva.

Преподаватель в режиме реального времени на онлайн-доске Canva Whiteboard визуализирует основные понятия, используя: иконки, рукописные стрелки и блоки, простые рисунки, стикеры, ветвящиеся схемы.

Содержание визуального цифрового скрайб-конспекта:

1. Что такое облачные технологии

2. Виды: IaaS, PaaS, SaaS

3. Примеры облачных сервисов (Google Drive, iCloud, Zoom, Canva и др.)

4. Преимущества: доступность, экономия, безопасность, совместная

работа

5. Применение в образовании и бизнесе

Преподаватель показывает, как строить визуальные связи, систематизировать материал и создавать наглядные блоки.

III. Уточнение и обсуждение (5 минут)

Обратная связь: «Что было понятно? Что бы вы хотели добавить?»

Вопросы по ходу лекции

Подчёркивание важности визуальной грамотности

IV. Практическая часть: Групповая работа (30 минут)

Создание цифрового скрайб-конспекта на Canva Whiteboard

Инструкция студентам:

1. Объединитесь в группы по 3–4 человека.
2. Откройте общий шаблон доски Canva (выдается преподавателем) или создайте новый документ.

Что нужно отразить на доске: ключевые понятия, схемы и связи, минималистичные иконки, связь с реальной жизнью (примеры из опыта).

Цель — создать логичный, визуально структурированный цифровой скрайб-конспект по выбранной теме.

V. Презентация работ (15 минут)

Каждая группа презентует свою доску, объясняя структуру и ключевые идеи.

Остальные студенты задают уточняющие вопросы.

Преподаватель даёт наводящие вопросы: «Что получилось особенно выразительно и почему?».

VI. Рефлексия (5 минут)

Вопросы:

Что нового вы узнали сегодня?

Насколько удобно визуализировать материал при помощи технологии scribing?

Что бы вы использовали из этого подхода на других предметах?

Онлайн-голосование или стикеры на доске: «Оцените, насколько полезным был этот формат занятия»

Домашнее задание:

Создать индивидуальный маленький скрайб-конспект в Canva на тему:

“5 способов применения облачных технологий в моей профессии”.

Ниже на рисунках 2 и 3 приведены результаты работы (скрайб-конспект) студентов.



Рис-2. Скрайб-конспект студента группы МИ-1.23

Fig. 2. Scribe notes of a student from group MI-1.23



Рис-3. Скрайб-конспект студентки группы МИ-1.23

Fig. 3. Scribe notes of a student from group MI-1.23

3.2. Результаты опытно-экспериментальных работ

Опытно-экспериментальные работы для проверки эффективности методики развития профессиональной компетентности студентов на основе технологии scribing проводились в Национальном педагогическом

университете Узбекистана имени Низами, в Шахрисабзском государственном педагогическом институте и в Ургенчском государственном педагогическом институте.

В ходе реализации модели развития профессиональной компетентности студентов на основе технологии scribing были получены результаты, подтверждающие эффективность технологии scribing в развитии профессиональной компетентности студентов.

Уровень сформированности профессиональной компетентности у студентов экспериментальной группы повысился на 20–25 % по сравнению с контрольной группой, что подтверждается результатами анкетирования и тестирования. Студенты продемонстрировали более высокую способность к структурированию учебного материала, развитию критического мышления и визуализации профессиональных знаний.

Использование scribing способствовало росту мотивации к самостоятельной работе, активизации познавательной деятельности и повышению качества выполнения практических заданий. Отмечено улучшение навыков командной работы и взаимодействия при коллективном создании скрайб-конспектов, что положительно сказалось на формировании профессионально значимых компетенций. Студенты стали чаще применять нестандартные подходы к решению учебных и профессиональных задач, что свидетельствует о развитии творческого потенциала.

Показатели наглядно отображены в таблице 2.

Таблица 2. Результаты опытно-экспериментальных работ

Table 2. Results of experimental work

Показатель	До внедрения scribing	После внедрения scribing
Уровень профессиональной компетентности (по тестам)	средний (50–55 %)	высокий (70–80 %)
Мотивация к самостоятельной работе	Средняя	высокая
Качество выполнения практических заданий	удовлетворительное	значительно улучшенное
Навыки визуализации и структурирования информации	практически отсутствовали	устойчиво сформированы
Командная работа и коммуникация	слабая вовлечённость	активное взаимодействие
Креативность и нестандартные решения	проявлялась редко	проявляется регулярно

Таким образом, внедрение технологии scribing в образовательный процесс доказало свою эффективность как средство формирования профессиональной компетентности студентов, обеспечив как количественные, так и качественные положительные изменения.

4. Обсуждение

Полученные результаты исследования подтверждают эффективность

применения технологии scribing в образовательном процессе высших учебных заведений. Анализ показал, что использование визуализации информации способствует не только более глубокому усвоению учебного материала, но и формированию ключевых профессиональных компетенций студентов. В частности, отмечено развитие навыков структурирования знаний, повышение мотивации к самостоятельной работе, а также формирование умений коммуникации и командного взаимодействия.

Сравнение данных исследования с результатами других авторов, изучавших инновационные технологии обучения, позволяет утверждать, что scribing обладает рядом уникальных преимуществ. Так, Кутепова и её соавторы отмечают, что scribing способствует развитию критического мышления и самостоятельности студентов. [8] Аналогичные выводы представлены в работе Богдановой и Градинарь, где подчёркивается значимость видеоскрайбинга для повышения качества усвоения материала. [19], кроме того, исследования, проведённые в Белорусском государственном университете, демонстрируют эффективность scribing при изучении географии и других дисциплин, подчёркивая его роль в обновлении содержания образования. [20]

Практическая значимость модели заключается в возможности её внедрения в образовательный процесс вузов различного профиля. Scribing может быть успешно использован как в гуманитарных дисциплинах, так и в технических, медицинских и экономических направлениях подготовки. Его применение способствует формированию у студентов универсальных навыков работы с информацией, которые востребованы в профессиональной деятельности современного специалиста.

Вместе с тем исследование имеет определённые ограничения. Во-первых, выборка студентов была ограничена по численности, что не позволяет в полной мере экстраполировать результаты на всю систему высшего образования. Во-вторых, апробация модели проводилась преимущественно в рамках отдельных дисциплин, что требует дальнейшего расширения её применения.

Перспективы дальнейших исследований связаны с интеграцией цифровых инструментов scribing в образовательный процесс, что позволит использовать возможности онлайн-досок, графических планшетов и специализированных программ. Кроме того, актуальным направлением является изучение влияния scribing на развитие других компетенций — лидерских, межкультурных и исследовательских. Особое внимание следует уделить применению технологии в условиях дистанционного обучения, где визуализация информации играет ключевую роль в поддержании заинтересованности студентов.

Таким образом, обсуждение результатов подтверждает, что scribing является эффективным инструментом развития профессиональной компетентности студентов. Его использование обеспечивает не только усвоение знаний, но и формирование навыков, необходимых для успешной

профессиональной деятельности в условиях современного общества.

5. Заключение

Проведённое исследование подтвердило эффективность применения технологии scribing как инновационного средства развития профессиональной компетентности студентов. Разработанная модель, включающая подготовительный, учебный, практический и рефлексивный этапы, показала свою результативность в формировании ключевых навыков: работы с информацией, коммуникации, критического мышления и самостоятельности.

Использование scribing в образовательном процессе способствует не только более глубокому усвоению учебного материала, но и развитию креативности, способности к визуализации знаний и их структурированию. Важным результатом стало повышение мотивации студентов к самостоятельной деятельности и активизация их познавательной активности.

Несмотря на выявленные ограничения исследования (ограниченность выборки, специфика дисциплин), полученные данные позволяют утверждать, что технология scribing может быть рекомендована для широкого внедрения в практику высшего образования. Она обладает универсальным характером и может применяться в различных направлениях подготовки специалистов.

Перспективы дальнейших исследований связаны с интеграцией цифровых инструментов scribing, расширением сферы его применения и изучением влияния на развитие дополнительных компетенций — лидерских, межкультурных и исследовательских.

Таким образом, scribing выступает как эффективная педагогическая технология, обеспечивающая целостное развитие профессиональной компетентности студентов и отвечающая современным требованиям образовательного процесса.

Использованные источники:

1. Özyurt Serim A. B., Bilgili A. Digitized Higher Education: Digital Transformation in Education from a Bibliometric Perspective. The Journal of International Scientific Researches, 2023;8(3):531-549. <https://doi.org/10.23834/isrjournal.1359200>
2. Trinh T. T. P., Nguyen T.-T., Nguyen D. N. Digital transformation in education: a bibliometric analysis using Scopus. European Science Editing. 2023;49:1-14. DOI: <https://doi.org/10.3897/ese.2023.e107138>.
3. Schoenherr J., Strohmaier A. R., Schukajlow, S. Learning with visualizations helps: A meta-analysis of visualization interventions in mathematics education. Educational Research Review, 100639. 2024;45:1-17. doi:10.1016/j.edurev.2024.100639
4. Aghel M., Azam S. M. F., Azlina M. K. A. Visualization of global research trends and future research directions of intellectual capital in higher education using bibliometric analysis. International Journal of Academic Research in Business and Social Sciences. 2024;14(10):2204-2221. DOI: 10.6007/IJARBS/v14-i10/23077.
5. Петровский П. В., Любецкий Н. С., Кутузова М. А. Скрайбинг. Объяснить

просто. Москва: Издательство «Э», 2016. 145 с.

6. Поличка А. Е., Табачук Н. П., Мельникова В. В. Технология скрайбинга для развития информационной компетенции студентов вуза: на примере дисциплины «Информатика». Современные проблемы науки и образования. 2020;6:-. DOI: <https://doi.org/10.17513/spno.30356>

7. Желтухина М.Р., Пономаренко Е.Б. «СКРАЙБИНГ КАК СРЕДСТВО ИНТЕРАКТИВНОЙ ВИЗУАЛЬНОЙ КОММУНИКАЦИИ» Проблемы современного педагогического образования, 2021;71(4):95-100.

8. Кутепова Л. И., Смирнова Ж. В., Комлева В. Ш., Стряпихина А. А. Скрайбинг как технология визуализации образовательного процесса. Балтийский гуманитарный журнал. 2021;10(3(36)):153–155. DOI: 10.26140/bgз3-2021-1003-0036.

9. Schoenherr J., Strohmaier A. R., Schukajlow S. Learning with visualizations helps: A meta-analysis of visualization interventions in mathematics education. Educational Research Review, 2024;45:1-17.

10. Турсунова Л. К. Научно-методические основы развития профессиональной компетентности студентов на основе технологии Scribing. Ta'lim, fan va innovatsiya: ma'naviy-ma'rifiy, ilmiy-uslubiy jurnal. 2024; 5:1034-1039. ISSN 2181-8274.

11. Турсунова Л. К., «Скрайбинг - эффективная технология в образовании». PEDAGOGIKA, Nizomiy. 2024; 3:236-239

12. Зимняя И. А. Ключевые компетенции как результативно-целевая основа компетентного подхода в образовании. Москва: Исследовательский центр проблем качества подготовки специалистов; 2004. 42 с.

13. Хуторской А. В. Ключевые компетенции как компонент личностно-ориентированной парадигмы образования. Педагогика. 2002; 10:58-64.

14. Федосова О. А., Соколина Е. Н. О значении визуализации учебной информации. Проблемы педагогики. 2018;3(35):1-4.

15. Cherukunnath D., et al. Exploring cognitive processes of knowledge acquisition to enhance learning design. Frontiers in Psychology. 2022;13: -. DOI: <https://doi.org/10.3389/fpsyg.2022.682628>

16. Da An, Ye C., Liu S. The influence of metacognition on learning engagement: the mediating effect of learning strategy and learning behavior. Current Psychology. 2024; 43:31241-31253. DOI: <https://doi.org/10.1007/s12144-024-06400-y>

17. Adam N. L., Alzahri F. B., Soh S. C., Bakar N. A., MohamadKamal N. A.. Self-regulated learning and online learning: A systematic review. In Lecture Notes in Computer Science 2017; 5:143–154. https://doi.org/10.1007/978-3-319-70010-6_14.

18. Zhang L., Ma Y. A study of the impact of project-based learning on student learning effects: a meta-analysis study. Frontiers in Psychology. 2023;14:1-14. DOI: 10.3389/fpsyg.2023.1202728

19. Богданова В., Градинарь О. Методические рекомендации по применению технологии видеоскрайбинга в образовательном процессе. Acta et Commentationes, Sciences of Education. 2024;2(36):15-22.

20. Белорусский государственный университет. Технология скрайбинга в образовательном процессе. Минск: БГУ; 2022. 120 с.

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ВЛИЯНИЕ ПОЛИТИКИ ЭНЕРГОСБЕРЕЖЕНИЯ НА ЭКОНОМИЧЕСКУЮ УСТОЙЧИВОСТЬ ПРОМЫШЛЕННЫХ ПРЕДПРИЯТИЙ

Аннотация. В статье рассматривается влияние политики энергосбережения на экономическую устойчивость промышленных предприятий. Актуальность исследования обусловлена ростом цен на энергоресурсы, усилением конкуренции и необходимостью обеспечения долгосрочной стабильности промышленного производства.

Ключевые слова: энергосбережение, энергетическая политика, промышленное предприятие, экономическая устойчивость, энергоэффективность.

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THE IMPACT OF ENERGY EFFICIENCY POLICY ON THE ECONOMIC SUSTAINABILITY OF INDUSTRIAL ENTERPRISES

Abstract. The paper examines the impact of energy efficiency policy on the economic sustainability of industrial enterprises. The relevance of the study is driven by rising energy prices, increased competition, and the need to ensure long-term industrial stability.

Keywords: energy saving, energy efficiency policy, industrial enterprise, economic sustainability, energy efficiency.

Введение

В современных условиях развития мировой экономики вопросы рационального использования энергетических ресурсов приобретают особую значимость. Рост цен на энергоносители, ограниченность природных ресурсов и усиление экологических требований оказывают существенное влияние на деятельность промышленных предприятий. В связи с этим политика энергосбережения становится одним из ключевых факторов обеспечения экономической устойчивости и конкурентоспособности промышленного сектора. Промышленные предприятия являются

крупнейшими потребителями энергетических ресурсов, что делает их особенно чувствительными к изменениям энергетической политики государства. Внедрение энергосберегающих мер позволяет не только снизить себестоимость продукции, но и повысить финансовую устойчивость предприятий в долгосрочной перспективе. Целью настоящего исследования является анализ влияния политики энергосбережения на экономическую устойчивость промышленных предприятий и обоснование целесообразности внедрения энергоэффективных решений.

Методы исследования

В процессе исследования использовался комплекс методов экономического анализа, включающий:

- анализ структуры энергопотребления промышленных предприятий;
- оценку затрат на энергетические ресурсы;
- сравнительный анализ показателей до и после внедрения энергосберегающих мероприятий;
- системный подход к оценке экономической устойчивости.

Экономическая устойчивость предприятия рассматривается как совокупность показателей финансовой стабильности, рентабельности, конкурентоспособности и способности адаптироваться к внешним изменениям.

Политика энергосбережения в промышленности

Политика энергосбережения представляет собой совокупность организационных, технических и экономических мер, направленных на рациональное использование энергетических ресурсов. В промышленности она реализуется через модернизацию оборудования, внедрение энергоэффективных технологий и совершенствование систем управления энергопотреблением. Государственная поддержка энергосберегающих программ, налоговые льготы и стимулирующие механизмы способствуют активному внедрению энергоэффективных решений на предприятиях. Это, в свою очередь, положительно отражается на экономических показателях деятельности.

Влияние энергосбережения на экономическую устойчивость

Внедрение политики энергосбережения оказывает комплексное влияние на экономическую устойчивость промышленных предприятий. Основными эффектами являются:

- снижение энергетических затрат и себестоимости продукции;
- повышение рентабельности производства;
- снижение зависимости от колебаний цен на энергоносители;
- улучшение инвестиционной привлекательности.

Экономический анализ показывает, что предприятия, активно внедряющие энергосберегающие технологии, обладают более высокой устойчивостью к внешним экономическим рискам.

Экономическая оценка энергосберегающих мероприятий

Экономическая эффективность энергосберегающих мероприятий оценивается на основе показателей срока окупаемости, чистого дисконтированного дохода и внутренней нормы доходности. Практика показывает, что большинство энергоэффективных проектов в промышленности имеют срок окупаемости от 2 до 5 лет. Дополнительный экономический эффект достигается за счёт сокращения затрат на техническое обслуживание и увеличения срока службы оборудования.

Обсуждение результатов

Полученные результаты подтверждают, что политика энергосбережения является важным инструментом обеспечения экономической устойчивости промышленных предприятий. Она способствует формированию устойчивой модели развития, ориентированной на долгосрочную эффективность и снижение ресурсной зависимости. Особое значение имеет интеграция энергосберегающих мер в общую стратегию развития предприятия.

Заключение

В статье рассмотрено влияние политики энергосбережения на экономическую устойчивость промышленных предприятий. Установлено, что внедрение энергоэффективных технологий и рациональное управление энергопотреблением способствуют снижению издержек, повышению конкурентоспособности и укреплению финансовой стабильности. Полученные выводы могут быть использованы при разработке стратегий устойчивого развития промышленного сектора.

Использованные источники:

1. O. Ishnazarov, X. Xaydarov, "Mathematical Analysis of the Impact of External Factors on the Operating Modes of Pump Installations in the Technological Process," Journal of Academia Open, vol. 10, no. 1, 2025, <https://doi.org/10.21070/acopen.10.2025.10507>
2. N. Pirmatov, X. Xaydarov, S. Abduraxmonov and Sh. Sayitov. Energy saving using a frequency converter in asynchronous motor operating modes // E3S Web of Conferences 508, 2024, no. 08011, <https://doi.org/10.1051/e3sconf/202450808011>
3. N. Pirmatov, S. Mahamadjonov, M. Matqosimov and H. Haydarov, "Characteristics of the static and dynamic operating modes of the asynchronous generator in renewable energy sources and the production of electric energy control through a frequency converter," in 2024 II International Scientific and Practical Conference "Energy, Ecology and Technology in Agriculture", E3S Web Conferences 480, no. 01007, <https://doi.org/10.1051/e3sconf/202448001007>

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ЭКОНОМИЧЕСКИЕ ОСНОВАНИЯ АНАЛИЗА ПОТЕРЬ ЭНЕРГИИ В ПРОМЫШЛЕННЫХ НАСОСНЫХ СИСТЕМАХ И ВНЕДРЕНИЯ ЭНЕРГОСБЕРЕГАЮЩИХ ТЕХНОЛОГИЙ

***Аннотация.** В статье рассматриваются вопросы анализа энергетических потерь в промышленных насосных системах и экономического обоснования внедрения энергосберегающих технологий. Актуальность исследования обусловлена ростом энергопотребления в промышленности и необходимостью повышения энергетической эффективности оборудования. Целью работы является выявление основных источников потерь энергии в насосных установках и оценка экономической эффективности применения современных методов энергосбережения. В работе использованы методы энергетического анализа, технико-экономических расчетов и сравнительной оценки.*

***Ключевые слова:** насосные системы, потери энергии, энергоэффективность, энергосбережение, экономическая эффективность.*

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ECONOMIC JUSTIFICATION FOR THE ANALYSIS OF ENERGY LOSSES IN INDUSTRIAL PUMPING SYSTEMS AND THE IMPLEMENTATION OF ENERGY-SAVING TECHNOLOGIES

***Abstract.** The paper analyzes energy losses in industrial pumping systems and provides an economic justification for the implementation of energy-saving technologies. The relevance of the study is determined by increasing energy consumption in industry and the need to improve equipment efficiency. The purpose of the research is to identify the main sources of energy losses in pumping installations and to evaluate the economic efficiency of modern energy-saving solutions. Energy analysis and techno-economic assessment methods are used.*

***Keywords:** pumping systems, energy losses, energy efficiency, energy saving, economic efficiency.*

Введение

Промышленные насосные системы занимают значительную долю в структуре энергопотребления предприятий различных отраслей промышленности. По оценкам международных энергетических организаций, на насосное оборудование приходится до 20–25% всей потребляемой электроэнергии в промышленном секторе. В условиях роста тарифов на энергоресурсы и ужесточения требований к энергоэффективности проблема снижения энергетических потерь приобретает особую актуальность. Энергетические потери в насосных системах обусловлены как конструктивными особенностями оборудования, так и нерациональными режимами эксплуатации. Неправильный подбор насосов, работа в режиме частичной нагрузки, избыточное дросселирование и отсутствие систем регулирования приводят к значительному перерасходу электроэнергии. Целью данной работы является анализ основных источников энергетических потерь в промышленных насосных системах и разработка экономического обоснования внедрения энергосберегающих технологий.

Методы исследования

В работе применён комплексный подход, включающий энергетический и экономический анализ насосных систем. Основными методами исследования являются:

- анализ энергетического баланса насосных установок;
- определение коэффициентов полезного действия оборудования;
- расчет потерь энергии в электродвигателе, насосе и трубопроводах;
- технико-экономическая оценка вариантов энергосбережения.

Для оценки эффективности энергосберегающих мероприятий использованы показатели годовой экономии электроэнергии, снижение эксплуатационных затрат и срок окупаемости инвестиций. Расчеты выполнены для типовой промышленной насосной установки, работающей в переменном режиме нагрузки.

Анализ потерь энергии в промышленных насосных системах

Основные потери энергии в насосных системах возникают на следующих этапах:

1. Потери в электродвигателе, связанные с электрическими и механическими потерями.
2. Гидравлические потери в насосе, обусловленные несовершенством проточной части.
3. Потери в трубопроводной сети, возникающие из-за сопротивления, утечек и нерациональной конфигурации.
4. Регулировочные потери, связанные с применением дросселирования вместо частотного регулирования.

Анализ показывает, что значительная часть энергии теряется при работе насосов вне номинального режима. Это свидетельствует о необходимости внедрения систем автоматического регулирования и оптимизации режимов работы.

Энергосберегающие технологии в насосных системах

К числу наиболее эффективных энергосберегающих технологий относятся:

- применение частотно-регулируемых электроприводов;
- замена устаревших насосов на высокоэффективные модели;
- оптимизация гидравлических параметров трубопроводов;
- автоматизация управления насосными агрегатами.

Особое значение имеет использование частотных преобразователей, позволяющих адаптировать производительность насосов к реальной нагрузке и снизить потребление электроэнергии на 20–40%.

Экономическое обоснование внедрения энергосберегающих технологий

Экономическая эффективность внедрения энергосберегающих решений оценивается на основе расчета капитальных вложений и эксплуатационной экономии. Основными экономическими показателями являются:

- годовая экономия электроэнергии;
- снижение затрат на техническое обслуживание;
- срок окупаемости инвестиций.

Результаты расчетов показывают, что при внедрении частотно-регулируемого привода срок окупаемости проекта составляет в среднем 2–3 года, что делает такие мероприятия экономически целесообразными.

Обсуждение результатов

Проведённый анализ подтверждает, что энергосбережение в насосных системах является одним из наиболее эффективных направлений повышения общей энергетической эффективности промышленного предприятия. Экономический эффект достигается не только за счёт снижения потребления электроэнергии, но и благодаря увеличению ресурса оборудования.

Заключение

В статье выполнен анализ энергетических потерь в промышленных насосных системах и обоснована целесообразность внедрения энергосберегающих технологий. Показано, что применение современных методов регулирования и оптимизации режимов работы позволяет существенно снизить энергопотребление и эксплуатационные затраты. Полученные результаты могут быть использованы при разработке программ энергосбережения на промышленных предприятиях.

Использованные источники

1. O. Ishnazarov, X. Xaydarov, "Mathematical Analysis of the Impact of External Factors on the Operating Modes of Pump Installations in the Technological Process," Journal of Academia Open, vol. 10, no. 1, 2025, <https://doi.org/10.21070/acopen.10.2025.10507>
2. N. Pirmatov, X. Xaydarov, "Investigating the issues of energy saving by means of a mathematical model of transient processes of asynchronous engines in pump units," (in Uzbek), Journal of Science and innovative development, vol. 6, no. 5, pp. 63-71, <https://dx.doi.org/10.36522/2181-9637-2023-5-7>

3. N. Pirmatov, S. Mahamadjonov, M. Matqosimov and H. Haydarov, "Characteristics of the static and dynamic operating modes of the asynchronous generator in renewable energy sources and the production of electric energy control through a frequency converter," in 2024 II International Scientific and Practical Conference "Energy, Ecology and Technology in Agriculture", E3S Web Conferences 480, no. 01007, <https://doi.org/10.1051/e3sconf/202448001007>
4. N. Pirmatov, X. Xaydarov, S. Abduraxmonov and Sh. Sayitov. Energy saving using a frequency converter in asynchronous motor operating modes // E3S Web of Conferences 508, 2024, no. 08011, <https://doi.org/10.1051/e3sconf/202450808011>
5. X. Xaydarov, K. Qarshiyev, U. Berdiyev. Energy saving using a frequency converter in asynchronous motor operating modes // AIP Conf. Proc 2024, vol. 3152, no. 030008, <https://doi.org/10.1063/5.0219049>
6. X. Xaydarov, O. Ishnazarov, and J. Nizamov, "Analysis of the influence of vibration phenomena in pump systems on electrical energy consumption and operational efficiency," Vibroengineering Procedia, vol. 60, pp. 200–207, Dec. 2025, doi: <https://doi.org/10.21595/vp.2025.25606>

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КЛАССИФИКАЦИЯ ЭЛЕМЕНТАРНЫХ ГЕОХИМИЧЕСКИХ ЛАНДШАФТОВ

Аннотация. В статье рассматривается современная интерпретация теории элементарных геохимических ландшафтов, механизмы их формирования и классификационные признаки. Процессы миграции, перераспределения и аккумуляции химических элементов в природных ландшафтах анализируются во взаимосвязи с рельефом, водным режимом, условиями почвообразования и биотическими факторами. Обоснованы функциональные различия между элювиальными, транзитными и аккумулятивными элементарными геохимическими ландшафтами, а также раскрыта роль супераквальных фаций в структуре ландшафтных систем.

Ключевые слова: геохимический ландшафт, автоморфная фация, транзитный ландшафт, аккумулятивная среда, супераквальная фация, миграция веществ, грунтовые воды, рельеф, биогеоценоз, почвообразование.

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CLASSIFICATION OF ELEMENTARY GEOCHEMICAL LANDSCAPES

Abstract. The article examines the modern interpretation of elementary geochemical landscape theory, their formation mechanisms, and classification features. The processes of migration, redistribution, and accumulation of chemical elements in natural landscapes are analyzed in relation to relief, water regime, soil formation conditions, and biotic factors. Functional differences between eluvial, transitional, and accumulative elementary geochemical landscapes have been substantiated, and the role of super-aquatic facies in the structure of landscape systems has been revealed.

Keywords: geochemical landscape, automorphic facies, transit landscape, accumulative environment, super-aquatic facies, substance migration, groundwater, relief, biogeocenosis, soil formation

Концепция геохимических ландшафтов занимает важное место в изучении процессов миграции и пространственного перераспределения вещества в природной среде. Сформировавшись на стыке ландшафтоведения

и геохимии, данный подход позволяет выявить закономерности обмена веществ между компонентами ландшафта и определить их функциональную роль в географической оболочке.

Научные основы теории геохимических ландшафтов были заложены в начале XX века Б.Б. Полиновым, который обосновал тесную связь геохимических процессов с морфологией рельефа, водным режимом, условиями почвообразования и деятельностью живых организмов. В дальнейшем идеи Полинова получили развитие в трудах А.И. Перельмана, М.А. Глазовской и В.Н. Сукачёва, что способствовало углублению классификации элементарных геохимических ландшафтов и расширению их прикладного значения.

Сущность элементарного геохимического ландшафта. Под геохимическим ландшафтом понимается природная система, в пределах которой осуществляется миграция, трансформация и аккумуляция химических элементов и соединений. Такие системы формируются в результате взаимодействия геоморфологических, гидрологических и биологических факторов и характеризуются генетической взаимосвязанностью отдельных элементов.

С морфологической точки зрения элементарный геохимический ландшафт соответствует географической фации, а в экологическом аспекте — определённому биогеоценозу. В этой связи элементарные геохимические ландшафты представляют собой низший, но функционально значимый уровень организации ландшафтных систем.

Классификация элементарных геохимических ландшафтов В зависимости от направленности миграции веществ и условий их накопления элементарные геохимические ландшафты подразделяются на три основные группы.

1. Элювиальные (автономные, автоморфные) ландшафты. Элювиальные ландшафты приурочены, как правило, к наиболее возвышенным элементам рельефа — водоразделам. Для них характерно преобладание процессов выноса веществ, при этом почвообразование осуществляется преимущественно под воздействием атмосферных осадков. Минимальное влияние грунтовых вод обуславливает относительную геохимическую автономность данных ландшафтов.

Учитывая поступление веществ из атмосферы, А.И. Перельман предложил использовать термин «автоморфные ландшафты», который особенно адекватен для территорий с интенсивной антропогенной нагрузкой, в частности агроландшафтов.

В пределах элювиальных зон выделяются первичные и вторичные автоморфные фации. Кроме того, вдоль микро- и мезопонижений могут формироваться аккумулятивно-элювиальные фации, характеризующиеся частичным накоплением продуктов миграции.

2. Транзитные (транс-элювиальные) ландшафты. Транзитные ландшафты занимают промежуточное положение между элювиальными и

аккумулятивными зонами и характеризуются перемещением веществ вдоль склонов. Они геохимически подчинены вышележащим участкам, однако в их пределах возможно временное накопление отдельных элементов.

В зависимости от условий стока различают собственно трансэлювиальные и трансэлювиально-аккумулятивные ландшафты. В нижних частях склонов процессы переноса веществ сочетаются с их частичной аккумуляцией, при этом грунтовые воды могут периодически вовлекаться в геохимические процессы.

3. Супераквальные (аккумулятивные) ландшафты. Супераквальные элементарные геохимические ландшафты формируются в пониженных элементах рельефа, где уровень грунтовых вод приближен к поверхности. В данных условиях доминируют водно-геохимические процессы, обеспечивающие интенсивное накопление наиболее подвижных химических элементов и соединений.

Для супераквальных фаций характерно развитие специфических биогеоценозов, адаптированных к повышенной концентрации подвижных веществ. Типичными примерами являются солончаки, заболоченные тростниковые сообщества и луговые почвы с высоким содержанием карбонатов.

Классификация элементарных геохимических ландшафтов позволяет глубже понять механизмы пространственной миграции и аккумуляции веществ в природной среде. Геохимические различия между элювиальными, транзитными и супераквальными ландшафтами определяются, прежде всего, морфологией рельефа, водным режимом и условиями почвообразования. Включение супераквальных элементарных ландшафтов в классификационную схему способствует более полному отражению природного разнообразия ландшафтных фаций. Представленный научный подход имеет важное прикладное значение при оценке мелиоративного состояния территорий, анализе процессов засоления и заболачивания почв, а также при обеспечении экологической устойчивости ландшафтов в условиях антропогенного воздействия.

Использованные источники:

1. Перельман А.И. Геохимия ландшафта. - М.: Высш. школа, 1975. - 342 с.
2. Глазовская М.А. Типы почвенно-геохимических сопряжений // Вестн. МГУ. Сэп. 5. Геогр. -1969. -25.-С. 3-12.
3. Родыгина В.Г. Курс геохимии. Томск. 2006.- 223 с.
4. Ишанкулов М.Ш. Почвенно-мелиоративное учение о единстве процессов лито-морфо-педогенеза в дельтах и его географическая сущность // Пробл. освоения пустынь. -1979. - №5 С. 3-17.
5. Уразбаев А.К., Хурсанов Д.Б. Амударё хозирги дельтаси ландшафтларининг структураси. – Самарқанд. 2020. -138 б.

6. Rafikov V.A. Geosistema destruksiya va degradatsiyasining chegaralari va xususiyatlari hamda qayta tiklanishi. Geogr. fanlari doktori (DSc) diss. avtoreferati. - T.: 2017. - 61 b

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СИНОНИМИЧЕСКИЕ ОТНОШЕНИЯ УЗБЕКСКИХ И РУССКИХ ПОСЛОВИЦ

Аннотация: В данной статье в рамках сравнительного изучения пословиц широко освещаются их лингвокультурологические аспекты. Таким образом, была предпринята попытка показать сходства и различия пословиц на изучаемых нами языках, самобытную культуру и своеобразный менталитет народа, владеющего этим языком. При анализе лингвокультурологических аспектов узбекских и английских пословиц была предпринята попытка описать Взаимосвязь языка и культуры, рассмотреть тематически сходные аспекты пословиц на узбекском и английском языках и глубже подойти к таким вопросам, как менталитет и выражение национального характера.

Ключевые слова: лингвокультурологика, активность, инициативность, добросовестность, увлеченность и удовлетворенность, интеллектуальные силы.

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SYNONYMOUS RELATIONS OF UZBEK AND RUSSIAN PROVERBS

Abstract: In this article, as part of the comparative study of proverbs, their linguistic and cultural aspects are widely covered. Thus, an attempt was made to show the similarities and differences of proverbs in the languages we study, the original culture and the peculiar mentality of the people who speak this language. When analyzing the linguistic and cultural aspects of Uzbek and English proverbs, an attempt was made to describe the relationship between language and culture, to consider thematically similar aspects of proverbs in Uzbek and English and to approach issues such as mentality and expression of national character more deeply.

Keywords: linguoculturology a, activity, initiative, conscientiousness, passion and satisfaction, intellectual forces.

Пословицы и поговорки возникли в глубокой древности и создавались многими поколениями людей, развивались в течение столетий и с той поры сопутствуют человеку во всем на протяжении всей истории его существования. Знание пословиц и поговорок разных стран обогащает

словарный запас, приобщает к мудрости народа, помогает усвоить многие особенности языка, развивает память. Пословицы помогают усвоить образный строй языка, «увидеть единство и своеобразие языковых единиц» помогают понять отношение представителей того или иного народа к определенным областям человеческой жизни. Они являются самым любопытным жанром фольклора. А также в этих коротких, образных предложениях, содержащих законченную мысль, легче запоминаются новые иноязычные слова. Можно выделить такие свойства пословиц как: поучающее содержание и способность в сжатой форме выразить наблюдение, которое обобщает опыт и жизненный путь рассматриваемого культурного сообщества.

Пословицы разных языков часто не совпадают, используя их мы видим, как разные народы на различных континентах по-разному, но в то же время одинаково переосмыслили похожие жизненные ситуации, явления различной объективной действительности, и при этом характеризуя их своеобразными чертами. В каждой культуре есть свои особенности, которые отражены в пословицах. Пословицы и поговорки шагают с нами на протяжении всей нашей жизни. Данное исследование посвящено английским, русским и узбекским пословицам, поговоркам, их сходству и различиям, на тему «труд». Это позволяет ближе познакомиться с национальной культурой Англии, России и Узбекистана, понять, чем и насколько похожи эти народы и в чём их различие.

Изучение народных пословиц и поговорок рассматриваемых культур позволяет улучшить знания английского языка, получить возможность ознакомиться с обычаями Англии, углубленно проникнуться и изучить родной язык (в нашем случае - русский и узбекский), а также понять национальные особенности каждого народа, что способствует формированию толерантности и чувства уважения к своей и иной культуре.

В процессе изучения пословиц на английском, русском и узбекском языках вызывает интерес тот факт, что существует множество пословиц на разных языках, схожих по своему значению, несмотря на то, что культуры различны, имеют свои особенности и ценности. Сравнение пословиц разных народов позволяет определить и выявить духовный и нравственный облик народов, их стремления и идеалы, уклад их народной жизни. Нами было изучено 77 английских (29), русских (30) и узбекских пословиц (17). Сравнительный анализ рассмотренных паремий позволяет проследить отношение человека к труду в разных культурах, стремление человека проявлять физические и интеллектуальные силы, использовать свои знания и опыт для достижения определённых результатов. Английские, русские и узбекские пословицы складывались в различных исторических условиях, социальных организациях, убеждениях и системах действий, условиях общественно-экономического развития.

Подгруппа «Трудолюбие» или «Положительное отношение к труду». В этой подгруппе понимается, что отношение выражается в лучших качествах и

чертах человека. Главным аспектом этой подгруппы является любовь к труду. Примером может служить такая пословица в английском языке: *He works best who knows his trade* (Работает лучше всего тот, кто знает своё ремесло). И пословица в узбекском языке: *Иш устасидан куркади* (Дело мастера боится). Эта пословица отражает такие черты характера как, добросовестность, мастерство, потребность не просто выполнять работу, а выполнять её наилучшим образом. Здесь мы видим отношение человека к своему делу, его любовь к труду, уважение и усердие в работе.

Также можно заметить, что пословицы в узбекском и английском языке отличаются по своей конструкции слов, но они имеют один и тот же смысл и значение. Вторым интересным фактом можно отметить, что пословица в узбекском языке переводится на русский язык дословно, и эта пословица является оригиналом пословицы в русском языке. В этой подгруппе пословицы отражают такое качество в человеке как, способность позитивно относиться к процессу трудовой деятельности, проявляя активность, инициативность, добросовестность, увлечённость и удовлетворённость самим процессом труда: *Measure the cloth ten times, thou canst cut it but once* (Отмерь ткань десять раз, прежде чем отрезать), *Семь раз отмерь, один раз отрежь*, *Етти улчаб бир кес* (Семь раз отмерь, один раз отрежь.)

Следующие пословицы, которые можно отнести к этой подгруппе, это русская пословица: *Воду в реке весна разливает, цену человеку труд добавляет* и узбекская пословица: *Дарё сувини бахор тоширар, одам кадрили мехнат оширар* (Весна реку разливает, труд человека прославляет). Здесь видно, что к некоторым пословицам во всех трех культурах можно найти аналог, но есть пословицы, к которым аналогов нет, в силу того, что особенности культур отличаются и не всегда можно найти аналоги пословиц разных языков. Это связано с историческим развитием стран, с их культурными ценностями, а также различным происхождением и сферами употребления их в дальнейшем. Подгруппа «Лень» или «Отрицательное отношение к труду». Эту подгруппу также ещё можно назвать безразличное отношение, к ней можно отнести такие черты характера как, лень, небрежность, которые выражаются в нерадивом отношении к труду, в формальном выполнении заданий. Аналог на русском: *Мед есть - в улей лезть*. Это выражение входит в группу пословиц, эквивалентным русской пословице «Без труда не вытащишь и рыбку из пруда», которые доказывают, что результата можно добиться, только если пойти на определённые усилия, а иногда даже пожертвовать чем-то. А эквивалент русской пословицы есть в узбекском языке: *Ховуздаги баликчани хам мехнатсиз тутиб булмайди* (Рыбку из пруда без труда не вытащишь).

Также мы видим сходства в том, что в аналогах пословиц на английском и на русском языках в качестве желаемого результата используется мёд, в английском языке мёд переводится как, *honey*. А в аналогах пословиц на русском и узбекском языках используется - рыбка, на узбекском языке рыбка переводится - балик. Так же мёд и пчелы фигурируют в ещё одной пословице:

No bees no honey, no work no money (Без пчёл не будет мёда, без работы не будет денег). Аналог на русском: без труда мёду не едят. Эта пословица, которая появилась где-то в вересковых пустошах Англии, родине верескового меда, отражает самую простую причинно-следственную связь между трудом и вознаграждением за него. Аналогом на русском языке служит пословица - Вода и камень точит. Здесь вода ассоциируется с человеком, так как она настойчиво и регулярно совершает движение, то есть течёт, и тем самым со временем может разрушить скалу. Так и человек может много добиться, если будет терпелив и прикладывать к делу определённые усилия.

В узбекском народе терпение ассоциируется с вышивкой, которой занимается каждая женщина. Пословицы о труде занимают значительное место в культурном наследии английского, русского и узбекского языков. Анализ русских пословиц показывает, что труд положительно оценивается в российском обществе. Безделье и лень употребляется только в отрицательном значении пословиц. Анализ узбекских пословиц показывает, что труд одно из главных составляющих узбекского народа.

Использованные источники:

1. Аникин В.П. Русские пословицы и поговорки / под ред. В.П. Аникина. -М., 1988. - 431 с.
2. Большой толковый словарь русского языка / под ред. С. А. Кузнецова -СПб.: Норинт, 2004. - 1534 с.
3. Митяева А.П. Ассоциативный эксперимент как способ конструирования концепта «бизнес» / А.П. Митяева // Молодой ученый. - 2015. - №11. - С. 1651-1653.
4. Ожегов С.И. Толковый словарь русского языка онлайн / [Электронный ресурс]. - Режим доступа: <https://slovarozhegova.ru/>, дата обращения 27.09.18

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АНАЛИЗ ПРОБЛЕМ ОБУЧЕНИЯ ТЕМАМ МАГНИТНОГО ПОЛЯ И ДИДАКТИЧЕСКАЯ МОДЕЛЬ

Аннотация: Темы, связанные с магнитным полем, относятся к числу наиболее сложных и концептуально трудных разделов физического образования. Международные исследования, посвящённые обучению физике, показывают наличие у студентов устойчивых неправильных представлений о магнитной индукции, силе Лоренца, магнитном поле вокруг проводника с током и движении заряженной частицы в магнитном поле.

В данной статье на основе анализа 30 ведущих международных исследований рассматриваются основные когнитивные, дидактические и методические проблемы обучения темам магнитного поля. В результате анализа выявленные проблемы были сгруппированы в четыре основные категории: абстрактность понятия поля, трудности векторного и пространственного мышления, преобладание математического формализма над концептуальным пониманием, а также ограниченность традиционных методов обучения.

Для преодоления указанных проблем предлагается дидактическая модель, основанная на интегрированном использовании визуализации с обратной связью, обучения, основанного на исследовательской деятельности, концептуального обсуждения и виртуальных лабораторий.

Ключевые слова: физическое образование, магнитное поле, сила Ампера, сила Лоренца, концептуальное понимание, исследовательское обучение, дидактическая модель.

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ANALYSIS OF PROBLEMS IN TEACHING MAGNETIC FIELD TOPICS AND DIDACTIC MODEL

Abstract: Topics related to the magnetic field are among the most complex and conceptually difficult sections of physics education. International research on physics teaching shows that students have persistent misconceptions about magnetic induction, the Lorentz force, the magnetic field around a current-carrying conductor, and the motion of a charged particle in a magnetic field.

This article, based on an analysis of 30 leading international studies, examines the main cognitive, didactic and methodological problems of teaching magnetic field topics. As a result of the analysis, the identified problems were grouped into four main categories: the abstractness of the field concept, the difficulties of vector and spatial thinking, the predominance of mathematical formalism over conceptual understanding, and the limitations of traditional teaching methods.

To overcome these problems, a didactic model based on the integrated use of visualization with feedback, inquiry-based learning, conceptual discussion, and virtual laboratories is proposed.

Key words: physics education, magnetic field, Ampere force, Lorentz force, conceptual understanding, inquiry learning, didactic model.

1. Введение

Понятие магнитного поля является центральным элементом раздела электромагнетизма и представляет собой не только одно из фундаментальных понятий физики, но и основу современных техники и технологий. Электродвигатели, генераторы, трансформаторы, магнитно-резонансная томография, ускорители частиц, а также многие компоненты современных информационных технологий непосредственно основаны на явлениях магнитного поля. В связи с этим эффективное преподавание тем, связанных с магнитным полем, является одной из стратегических задач общего физического образования.

Международные исследования, посвящённые преподаванию физики, показывают, что понятие магнитного поля остаётся одной из наиболее трудных для усвоения тем студентами [1-3]. Согласно результатам эмпирических исследований, обучающиеся часто путают магнитное поле с понятием силы, интерпретируя его не как самостоятельный физический объект, а как непосредственную причину воздействия на движение заряженной частицы, а также понимают связь между силой Лоренца, направлением поля и траекторией движения частиц преимущественно на формульном уровне, испытывая затруднения в глубоком осмыслении её физического содержания [1]. Данная ситуация, прежде всего, объясняется тем, что магнитное поле не воспринимается непосредственно органами чувств, то есть является абстрактным физическим понятием, обладающим пространственным характером [2]. Кроме того, представление понятия поля в традиционном обучении в основном через уравнения и расчётные задачи приводит к формированию у студентов устойчивых концептуальных ошибок [2,3].

Методические исследования показывают, что для эффективного усвоения подобных абстрактных понятий особое значение имеют подходы, основанные на активной познавательной деятельности студентов, включающей постановку вопросов, выдвижение гипотез, сбор доказательств посредством эксперимента или симуляции и анализ полученных результатов [2,3]. Наряду с этим интерпретация физических знаний не как совокупности формул, а как системы моделей и смыслов, то есть интегрированное использование визуальных моделей, векторных представлений и математических выражений, обеспечивает глубокое и устойчивое формирование понятия магнитного поля [3]. При этом студенты нередко трактуют магнитное поле как «невидимую силу», непосредственно воздействующую на тело, в результате чего понятия силы и поля оказываются смешанными [4].

В исследованиях по физическому образованию отмечается, что обучающиеся часто воспринимают магнитное поле не как самостоятельную физическую реальность, а как свойство магнита или проводника с током. Такой подход серьёзно препятствует полному пониманию пространственного распределения поля, его векторного характера и причинно-следственных связей. В результате такие ключевые понятия, как вектор магнитной индукции, направление силы Лоренца и движение заряженной частицы в магнитном поле, формируют у студентов устойчивые и долговременно сохраняющиеся неправильные представления [5-7]. Эти ошибочные представления особенно ярко проявляются при разграничении понятий поля и силы, определении направлений и смыслов векторных величин, а также при физическом объяснении траекторий движения частиц.

Кроме того, существенной дидактической проблемой при обучении темам магнитного поля является доминирование математического формализма. Во многих образовательных практиках раздел электромагнетизма излагается преимущественно с ориентацией на формулы и алгоритмы вычислений, при этом физический смысл этих формул, их связь с моделью поля и пространственная интерпретация раскрываются недостаточно. В результате студенты адаптируются к механическому решению задач, однако не способны концептуально или вербально объяснить физическую сущность магнитных явлений [8,9]. Данная ситуация указывает на наличие разрыва между применением формул и формированием понимания, что приводит к низкому уровню концептуального усвоения.

Преобладание традиционных лекционных и доско-ориентированных методов обучения дополнительно усугубляет указанные проблемы, поскольку такие подходы не позволяют в полной мере отразить динамический и пространственный характер явлений магнитного поля. Исследования в области физического образования показывают, что пассивные методы обучения в разделе электромагнетизма непосредственно связаны с низким уровнем концептуального усвоения, сохранением неправильных представлений и неспособностью переноса знаний в новые ситуации [10-12].

В связи с этим в последние годы значительно возрос интерес к активным методам обучения темам магнитного поля, основанным на визуализации, исследовательском обучении, концептуальном обсуждении и виртуальных лабораториях.

В то же время, несмотря на то что в современной литературе по физическому образованию широко освещены концептуальные трудности усвоения понятия магнитного поля, устойчивые неправильные представления и ограничения формульно-ориентированного обучения, до настоящего времени недостаточно разработана и эмпирически обоснована практическая модель, интегрирующая визуализацию, исследовательскую деятельность, математическое обобщение и рефлексию в единую дидактическую систему с механизмами обратной связи. Данное обстоятельство и составляет основную научную лакуну настоящего исследования.

В связи с этим целью данной статьи является системный анализ основных когнитивных и дидактических проблем обучения темам магнитного поля, а также научно-методическое обоснование интегрированной дидактической модели, основанной на обратной связи и направленной на преодоление указанных проблем с опорой на результаты исследований в области физического образования.

2. АНАЛИЗ ЛИТЕРАТУРЫ: ПРОБЛЕМЫ ОБУЧЕНИЯ МАГНИТНОМУ ПОЛЮ

2.1. Абстрактность понятия поля

Абстрактность понятия магнитного поля является одной из наиболее часто отмечаемых концептуальных проблем в физическом образовании. Результаты диагностических тестов по электромагнетизму, разработанных Малони и соавторами, показывают, что студенты относят магнитное поле наряду с электрическим полем к числу наиболее неправильно интерпретируемых понятий [1]. Согласно результатам исследований, обучающиеся воспринимают магнитное поле не как самостоятельную физическую реальность, а лишь как «свойство», принадлежащее магниту или источнику тока.

Гисасола и соавторы, проведя качественный анализ представлений студентов университетов о магнитном поле, установили, что большинство из них рассматривает магнитное поле не как физический объект, существующий в пространстве, а как явление, ограниченное областью расположения магнитных тел [5]. В исследовании на основе интервью и письменных заданий зафиксировано, что студенты воспринимают линии магнитного поля как реальные физические объекты, интерпретируя их в виде «видимых путей». Данное явление объясняется недостаточным разъяснением моделирующего характера линий магнитного поля.

В литературе по исследованиям в области физического образования также подчёркивается, что пространственное распределение магнитного поля представляет для студентов особую трудность. Обучающиеся испытывают затруднения в понимании изменения величины магнитной индукции от точки

к точке, принципа суперпозиции и существования поля независимо от источника. Данная проблема особенно ярко проявляется при анализе магнитного поля, создаваемого несколькими проводниками с током или в сложных геометрических конфигурациях [3,5].

По моему мнению, данная проблема обусловлена не только абстрактностью магнитного поля, но и недостаточным закреплением «модели поля» в практике преподавания. Во многих случаях на занятиях линии магнитного поля представляются в виде готовых схем, при этом не раскрывается их модельный характер, то есть не объясняется, что они не являются реальными объектами, а служат средством отображения интенсивности и направления поля. В результате студенты начинают воспринимать магнитное поле как «видимую субстанцию» и не осознают его как непрерывно распределённую в пространстве физическую величину. В связи с этим считаю необходимым при обучении темам магнитного поля формировать понятие поля как самостоятельный и центральный дидактический объект, предшествующий введению понятия силы.

В итоге понятие магнитного поля не формируется у студентов на должном концептуальном уровне, а последующие темы - сила Лоренца, движение заряженных частиц и электромагнитная индукция - усваиваются поверхностно.

2.2. Смешение понятий силы и поля

Одной из широко распространённых проблем при изучении магнитного поля является смешение понятий силы и поля. В исследованиях, проведённых Баньо и Эйлон, отмечается, что студенты часто отождествляют магнитное поле с силой и не принимают идею о существовании поля до возникновения силы [6]. По мнению обучающихся, если действие силы не ощущается, то магнитное поле также не существует.

Данное смешение особенно обостряется при изучении понятия силы Лоренца. Исследования показывают, что студенты испытывают затруднения в понимании того, что при движении заряженной частицы в магнитном поле сила возникает вследствие движения, тогда как само поле существует независимо от этого движения [7]. В результате у них формируются ошибочные причинно-следственные представления типа «магнитное поле воздействует на частицу» и «магнитное поле порождается частицей».

В исследованиях пространственного воображения, проведённых Торнквистом и соавторами, установлено, что студенты часто представляют магнитное поле вокруг проводника с током как силу, направленную вдоль направления тока [8]. Это приводит к неправильному применению правила правой руки и ошибкам в определении направлений векторов. Обучающиеся не способны чётко различить вектор магнитного поля и вектор силы Лоренца.

В литературе по исследованиям в области физического образования данная проблема также связывается с исторически и методически некорректной последовательностью введения понятий силы и поля. Если в процессе обучения понятие силы занимает центральное место, а понятие поля

вводится как вторичное, то в сознании студентов поле формируется как «производная» силы [6,9]. Такой подход противоречит современной полевой концепции электромагнетизма.

Согласно нашим аналитическим выводам, смешение понятий силы и поля является одной из наиболее методически опасных проблем в разделе магнитного поля, поскольку оно приводит к искажённому формированию всех последующих понятий. Если обучающийся ориентируется не на вопрос «откуда возникает сила?», а на вопрос «какое поле существует в пространстве и при каких условиях оно порождает силу?», то причинно-следственные связи формируются значительно более устойчиво. В связи с этим считаю необходимым при обучении темам магнитного поля закрепить дидактический принцип последовательности «поле $\rightarrow$ взаимодействие $\rightarrow$ сила». Такой подход не только углубляет концептуальное понимание студентов, но и формирует у будущих преподавателей методическое мышление, основанное на современной полевой концепции.

2.3. Проблемы векторного и пространственного воображения

Одной из наиболее «устойчивых» трудностей при изучении тем магнитного поля является корректное представление векторных величин (B , v , F) и их пространственных взаимосвязей. В исследованиях по физическому образованию неоднократно отмечается, что при определении направления силы Лоренца (правило правой руки, $v \times B$) студенты не в полной мере осознают взаимную перпендикулярность векторов и «одновременное пространственное расположение трёх векторов» [8-10]. Данная проблема, как правило, проявляется в двух типичных ситуациях:

- *Ошибка пространственной ориентации*: студенты воспринимают направления векторов в плоскости рисунка, тогда как магнитное поле часто задаётся направленным «в плоскость страницы» или «из плоскости страницы»;

- *Подмена ролей векторов*: отождествление B и F либо формирование ошибочного правила о том, что «сила направлена вдоль линий магнитного поля» [8,9].

Торнквист и соавторы отмечают, что при решении задач на определение направления магнитного поля и силы Лоренца студенты часто опираются на механическое запоминание правил, однако из-за отсутствия концептуального понимания условий и смысла их применения ошибки носят систематический характер [8]. Планинич также указывает, что трудности работы с векторами обусловлены не только недостаточной математической подготовкой, но и дефицитом наглядно-визуальных моделей [9]. В ряде других исследований подчёркивается, что при отсутствии множественных представлений одного и того же явления (диаграммы, графики, словесное объяснение, симуляция) студенты испытывают значительные затруднения в его понимании [10,11].

Использование двумерных рисунков для объяснения трёхмерного движения дополнительно усугубляет данную проблему [11]. В частности, если в практике обучения не закрепляется семантика символов $\bullet$ и $\times$

(направление из плоскости и в плоскость страницы), студенты пытаются «вращать» векторы в плоскости рисунка, что приводит к увеличению количества ошибок при определении направления вектора $\mathbf{v} \times \mathbf{B}$ [10,11].

По нашим наблюдениям, аналогичная проблема сохраняется и у будущих учителей физики: они помнят правило правой руки, однако, не связывая его с осмысленной визуальной моделью, теряются при изменении условий задачи (знак заряда, направление скорости или ориентация вектора $\mathbf{B}$ относительно плоскости страницы). В связи с этим считаю необходимым при изучении раздела «Магнитное поле» использовать не только заучивание правил, но и интеграцию трёхмерной визуализации (симуляций), множественных представлений и физических моделей (рука, ручка, картонные макеты). Такой подход создаёт методически устойчивую опору и для самого преподавателя.

2.4. Доминирование математического формализма

Одним из распространённых методических перекосов при обучении электромагнетизму является доминирование математического формализма над концептуальным содержанием. В работах Редиша, а также представителей школы Макдермотт показано, что электромагнетизм нередко преподаётся как «система формул», в результате чего студенты умеют вычислять, но не способны объяснять физический смысл явлений [12,13]. Такая практика приводит к преобладанию алгоритмического, пошагового подхода к решению задач [14].

В исследованиях Хеллера и Райфа, посвящённых когнитивной модели решения задач, также отмечается, что студенты часто стремятся решать задачи по «знакомому шаблону», не выстраивая физическую структуру ситуации, то есть модель явления [14]. В разделе магнитного поля это проявляется, в частности, следующим образом:

- студент умеет применять формулу $B = \frac{\mu\mu_0 I}{2\pi r}$, но не может обосновать направление магнитного поля;
- использует выражение $F = q\mathbf{v}B\sin\theta$, но испытывает затруднения при объяснении того, почему сила перпендикулярна скорости;
- не понимает физического смысла множителя $\sin\theta$, отражающего влияние только перпендикулярной компоненты скорости [12-14].

Результаты исследований в традиции Макдермотт и Шаффера показывают, что введение математических выражений без предварительного построения концептуального содержания часто приводит к «номинальному усвоению»: студенты могут получить правильный численный ответ, но не способны объяснить логику физического явления [13]. Редиш интерпретирует данное явление как разрыв между формой (математическим выражением) и смыслом (физической моделью) [12].

По нашему мнению, в разделе магнитного поля необходимо не сокращать использование математики, а правильно встроить её в концептуальную последовательность: сначала модель (поле→

взаимодействие → направление), затем визуальное доказательство (симуляция или эксперимент), и лишь после этого - математическое обобщение. В высшем образовании, особенно при подготовке будущих учителей, формула должна выступать как «итоговая краткая запись», опирающаяся на ранее сформированное физическое содержание. В противном случае возрастает риск того, что будущий преподаватель будет представлять формулы в учебном процессе как «готовые рецепты», лишённые концептуального основания.

2.5. Неэффективность традиционных методов обучения

В литературе, посвящённой преподаванию физики, неоднократно отмечается, что обучение электромагнетизму в традиционном (пассивном) лекционном формате часто приводит к низким показателям концептуального усвоения. Хейк, сравнивая интерактивные подходы с традиционными методами, показал, что первые, как правило, обеспечивают значительно более высокий уровень концептуального прироста знаний [15]. Виман и Перкинс также указывают, что ключевыми драйверами трансформации физического образования являются активное обучение, концептуальное обсуждение, оперативная обратная связь и использование симуляций [16]. В случае таких «невидимых» и динамических явлений, как магнитное поле, пассивное объяснение оказывается заведомо недостаточным: студенту трудно «построить» в сознании то, что он не может наблюдать напрямую, опираясь лишь на словесное изложение и записи на доске [17].

Согласно анализу Мельцера, при традиционных методах обучения студенты чаще достигают лишь кратковременного усвоения материала, при этом уровень концептуальной устойчивости остаётся низким; в условиях активного обучения, напротив, значительно усиливаются связи между понятиями [17]. В разделе магнитного поля данная проблема проявляется особенно отчётливо: если студент не видит пространственное распределение поля, не «проживает» взаимосвязи между векторами и не имеет возможности обсуждать и корректировать собственные ошибки, знания сохраняются не в виде целостной модели, а как набор разрозненных фактов [15-17].

Наши наблюдения в процессе работы с будущими учителями показывают, что в темах магнитного поля традиционная лекция может способствовать запоминанию отдельных элементов содержания, однако этого недостаточно для формирования компетенций преподавания. В профессиональной деятельности учитель вынужден не только излагать материал, но и визуализировать, объяснять и демонстрировать физические явления. В связи с этим при обучении разделу «Магнитное поле» представляется необходимым систематическое и взаимосвязанное использование визуализации (раскрытие пространственной структуры и векторного характера поля с помощью симуляций и анимаций), исследовательской деятельности, основанной на проблемных вопросах (почему наблюдается именно такое явление, при каких условиях результат изменяется), а также концептуального обсуждения.

Данная триада переводит учебный процесс из пассивного лекционного формата в активный познавательный процесс, в котором студенты выступают не как пассивные получатели готовых формул, а как активные участники, понимающие и объясняющие физические явления. В результате у обучающихся формируются не только устойчивые концептуальные знания по магнитному полю, но и компетенции, необходимые для будущей педагогической и методической деятельности, включая умения ставить вопросы, давать объяснения и вести обсуждение на основе научной логики.

3. НАУЧНО ОБОСНОВАННЫЕ РЕШЕНИЯ ПО ПРЕОДОЛЕНИЮ ВЫЯВЛЕННЫХ ПРОБЛЕМ

3.1. Визуализация и симуляции

При изучении физических явлений, которые не могут быть непосредственно наблюдаемы с помощью органов чувств, таких как магнитное поле, средства визуализации обладают важным дидактическим значением. В частности, исследования, основанные на использовании интерактивных симуляций PhET, показывают, что динамическая и интерактивная демонстрация линий магнитного поля, вектора магнитной индукции и траекторий движения заряженных частиц существенно повышает уровень концептуального понимания у студентов [18-20]. Эти симуляции позволяют воспринимать магнитное поле не как статичное изображение или набор формул, а как непрерывно распределённую в пространстве физическую величину, чувствительную к изменению параметров.

В последние годы в исследованиях по физическому образованию широко обсуждается эффективность интерактивных и активных подходов к обучению, при этом особое внимание уделяется роли симуляций типа PhET в формировании концептуального понимания. Интерактивные симуляции PhET, разработанные Перкинсом и соавторами, рассматриваются как методическое решение, направленное на визуальное и интуитивное представление невидимых и абстрактных понятий физики [18]. Авторы подчёркивают, что данные симуляции трансформируют обучающихся из пассивных наблюдателей в активных субъектов исследовательской деятельности и являются более эффективным средством развития концептуального понимания по сравнению с формульно-ориентированным изложением. Несмотря на то, что в указанной работе магнитное поле не анализируется как отдельный эмпирический объект, решающая роль визуализации в обучении физическим понятиям, не поддающимся прямому восприятию, обоснована научно.

В исследовании Финкельштейна и соавторов анализируется сравнительная эффективность интерактивных компьютерных симуляций и реальных лабораторных экспериментов [19]. Результаты показывают, что симуляции предоставляют студентам возможность изучать физические процессы в безопасной, воспроизводимой среде с возможностью свободного изменения параметров. Авторы отмечают, что симуляции играют особенно важную роль в понимании причинно-следственных связей, поскольку

позволяют наблюдать не только результат, но и сам процесс в динамике. Данный вывод косвенно подтверждает методическую обоснованность использования симуляций при обучении таким пространственным и динамическим явлениям, как магнитное поле.

Адамс и соавторы эмпирически показывают, что образовательная эффективность интерактивных учебных сред определяется не столько уровнем технологической оснащённости, сколько качеством педагогического дизайна и целенаправленной интеграцией в учебный процесс [20]. По мнению авторов, если симуляции не сочетаются с исследовательской деятельностью, проблемными вопросами и концептуальным обсуждением, они могут превратиться в очередное средство пассивного обучения. Напротив, при интеграции интерактивных сред с подходом *обучение, ориентированное на исследование* концептуальное понимание студентов углубляется, а способность переноса знаний в новые ситуации значительно возрастает.

Настоящее исследование опирается на конструктивистскую теорию обучения, согласно которой знания формируются обучающимися в процессе активной когнитивной деятельности. Результаты квазиэкспериментального исследования показывают, что студенты, обучавшиеся в интерактивной и симуляционно-ориентированной среде, демонстрируют более высокие результаты при решении концептуальных задач и применении знаний в новых контекстах по сравнению с их сверстниками, обучавшимися в условиях традиционного лекционно-центрированного подхода. В соответствии с выводами авторов, определяющим фактором эффективности обучения является не сама технология, а её целенаправленная интеграция с исследовательски ориентированными педагогическими практиками.

Полученные результаты методически обосновывают необходимость использования интерактивных моделей и симуляций при обучении таким пространственным, динамическим и требующим визуализации темам, как электромагнетизм и магнитное поле. Хотя исследования [18-20] не содержат прямого эмпирического анализа понятия магнитного поля, они теоретически и экспериментально подтверждают общую дидактическую эффективность визуализации, исследовательского обучения и концептуального обсуждения при преподавании подобных тем. В этом контексте данные источники служат важной теоретической основой для интерпретации интегрированной дидактической модели обучения магнитному полю как методически обоснованного и научно легитимного подхода.

В сущности, визуализация в разделе «Магнитное поле» должна рассматриваться не как вспомогательное средство, а как основной дидактический опорный элемент. Традиционные досочные изображения не способны в полной мере отразить трёхмерную и динамическую природу магнитного поля. Поэтому симуляции целесообразно использовать не только как демонстрационный инструмент, но и как исследовательскую среду, в которой студент может самостоятельно изменять параметры, наблюдать результаты и анализировать их. Особенно для будущих учителей физики

такой опыт становится прочной методической опорой, позволяющей в дальнейшем эффективно объяснять явления магнитного поля в собственной педагогической практике.

3.2. Обучение, основанное на исследовательской деятельности

Подход, основанный на исследовательском обучении, широко признаётся в литературе как эффективная педагогическая стратегия для преодоления концептуальных трудностей, возникающих при изучении магнитного поля. Эткина и соавторы подчёркивают, что в модели исследовательски ориентированного обучения студент выступает не как пассивный получатель готовых законов и формул, а как активный участник образовательного процесса, формулирующий вопросы, выдвигающий гипотезы и делающий выводы на основе результатов экспериментов или наблюдений [21]. Авторы показывают, что данный подход особенно важен при изучении таких абстрактных понятий, как поле, сила и энергия, и эмпирически доказывают, что концептуальное понимание значительно углубляется в тех случаях, когда физические законы осваиваются студентами в процессе их «открытия». Эти результаты указывают на необходимость отказа от исключительно формульного изложения магнитного поля и перехода к его изучению как системы моделей и причинно-следственных связей.

Исследования, проведённые Холмсом и соавторами, анализируют роль исследовательски ориентированных лабораторных занятий в развитии научного мышления студентов [22]. Авторы показывают, что в рамках таких лабораторных работ обучающиеся активно развивают навыки сбора доказательств, анализа данных и формулирования выводов. Хотя в данном исследовании магнитное поле не рассматривалось как отдельный объект анализа, полученные выводы полностью применимы к разделу электромагнетизма, в частности к теме магнитного поля. Это обусловлено тем, что магнитное поле является типичным объектом исследовательской деятельности, требующим выявления причинно-следственных связей, анализа направлений векторов и обоснования физических явлений на основе экспериментальных данных. Результаты, полученные Холмсом и его коллегами, свидетельствуют о том, что обучение магнитному полю через исследовательскую деятельность способствует развитию не только уровня знаний, но и научного мышления.

Принс и Фелдер, обобщая исследования по исследовательскому и активному обучению в контексте инженерных и естественных наук, эмпирически и на основе метаанализа обосновывают преимущество данных подходов по сравнению с традиционными лекционно-центрированными методами обучения [23]. Авторы показывают, что образовательные среды, основанные на активном участии студентов, постановке вопросов и обсуждении, значительно повышают уровень концептуального понимания и способность переноса знаний в новые ситуации. Эти выводы подтверждают методическую обоснованность использования исследовательского обучения

при преподавании таких сложных и абстрактных понятий, как магнитное поле.

Результаты указанных исследований свидетельствуют о том, что студенты, обучавшиеся в условиях исследовательски ориентированного подхода, воспринимают магнитное поле не как совокупность формул, а как физическую модель и систему причинно-следственных связей [21,22]. Особенно эффективной оказывается исследовательская деятельность, организованная вокруг вопросов типа: «Как изменится траектория заряженной частицы при изменении её скорости?» или «В каком направлении изменится сила Лоренца при изменении направления магнитного поля?». Такие вопросы способствуют логическому и устойчивому формированию понятия магнитного поля.

По нашему мнению, раздел «Магнитное поле» является особенно благоприятным для реализации исследовательского обучения, поскольку в процессе его изучения у студентов естественным образом возникают вопросы типа «почему?» и «как?». Если преподаватель превращает эти вопросы в движущую силу учебного процесса, усвоение магнитного поля переходит от механического запоминания к логически-конструктивному построению знаний. В высшем образовании, особенно при подготовке будущих учителей физики, исследовательское обучение выступает важным педагогическим средством формирования методического мышления, а также основы для последующего проектирования эффективных уроков и глубокого объяснения физических понятий.

3.3. Концептуальные вопросы и обсуждение

В литературе неоднократно обосновано, что концептуальные вопросы и дискуссионный подход являются эффективным средством выявления и коррекции устойчивых неправильных представлений по темам магнитного поля [24-26]. В дискуссионном подходе студент сначала формулирует индивидуальный ответ на вопрос, затем аргументированно обсуждает его в малой группе и, в завершение, пересматривает собственную позицию. Такой процесс вынуждает обучающихся искать не столько «правильный ответ», сколько «обоснованное объяснение» [24]. Эмпирические результаты показывают, что в курсах, где используется обсуждение, возрастает уровень концептуального усвоения и способность мышления в проблемных ситуациях; при этом именно взаимное обсуждение студентов позволяет быстрее сделать неправильные представления «видимыми» и доступными для коррекции [25]. Так, Крауч и Мазур на основе многолетних данных учебной практики показали, что дискуссия существенно укрепляет концептуальное мышление и повышает уровень понимания у студентов [25].

В разделе «Магнитное поле» концептуальные вопросы специально конструируются для диагностики устойчивых ошибок понимания. В литературе описано, что при изучении электромагнитных понятий студенты часто опираются на упрощённые логические «эвристики», в результате чего неверно выстраивают связь между полем, силой и движением. В частности,

трудности в понимании взаимодействия зарядов с магнитным полем подробно задокументированы Малони и его последователями, при этом показано, что данные трудности связаны с наличием альтернативных концепций. Также отмечается, что студенты начального уровня демонстрируют низкие результаты в тестах по электромагнитному полю, а их объяснительные модели часто склоняются к интерпретации поля как свойства объекта, а не как самостоятельной физической реальности.

В этом контексте концептуальные вопросы по разделу «Магнитное поле» направлены на выявление таких типичных неправильных представлений, как: отождествление линий магнитного поля с траекторией движения заряженной частицы; представление направления силы Лоренца как совпадающего с направлением магнитного поля (игнорирование векторного произведения и перпендикулярности); убеждение в том, что магнитное поле существует только в момент воздействия на частицу (трактовка поля не как независимой пространственной реальности, а как явления, возникающего лишь при взаимодействии) [26]. При постановке подобных вопросов в формате обсуждения студент вынужден аргументировать свою позицию перед группой. Именно эта «необходимость обоснования» способствует более быстрому выявлению и исправлению ошибочных представлений. В банках концептуальных вопросов, предложенных Мазуром, представлены задания по магнетизму, в том числе направленные на понимание силы Лоренца.

В действительности в разделе «Магнитное поле» концептуальные вопросы не должны рассматриваться исключительно как инструмент оценивания; напротив, они должны выполнять функцию механизма обучения непосредственно в ходе занятия. Если студент переходит от установки «какой ответ правильный?» к вопросу «почему этот ответ является правильным?», знания о магнитном поле формируются значительно более устойчиво. Элементы обсуждения имеют особое значение при подготовке будущих учителей, поскольку в дальнейшей профессиональной деятельности им предстоит организовывать культуру обсуждения, постановку концептуальных вопросов и аргументированное объяснение на уроках школы или колледжа.

В результате проведённого анализа можно заключить, что литература указывает на невозможность эффективного преодоления концептуальных трудностей обучения магнитному полю с помощью одного-единственного метода. Наиболее результативным является сочетание визуализации, исследовательской деятельности и концептуального обсуждения [24-26]. Обсуждение делает концептуальные ошибки «видимыми» и обеспечивает механизм их оперативной коррекции; исследовательская деятельность позволяет студентам самостоятельно выстраивать причинно-следственные связи; визуализация облегчает восприятие пространственной и динамической природы поля. Именно эта триада образует теоретическую основу интегрированной дидактической модели, предлагаемой в следующем разделе.

4. ПРЕДЛАГАЕМАЯ ИНТЕГРИРОВАННАЯ ДИДАКТИЧЕСКАЯ МОДЕЛЬ

Для эффективного обучения таким абстрактным и высокотеоретическим понятиям, как магнитное поле, традиционные линейные подходы оказываются недостаточно результативными. В связи с этим в рамках настоящего исследования была разработана интегрированная дидактическая модель, основанная на механизмах обратной связи и опирающаяся на эффективные педагогические элементы, рекомендованные в исследованиях по преподаванию физики (рис. 1).

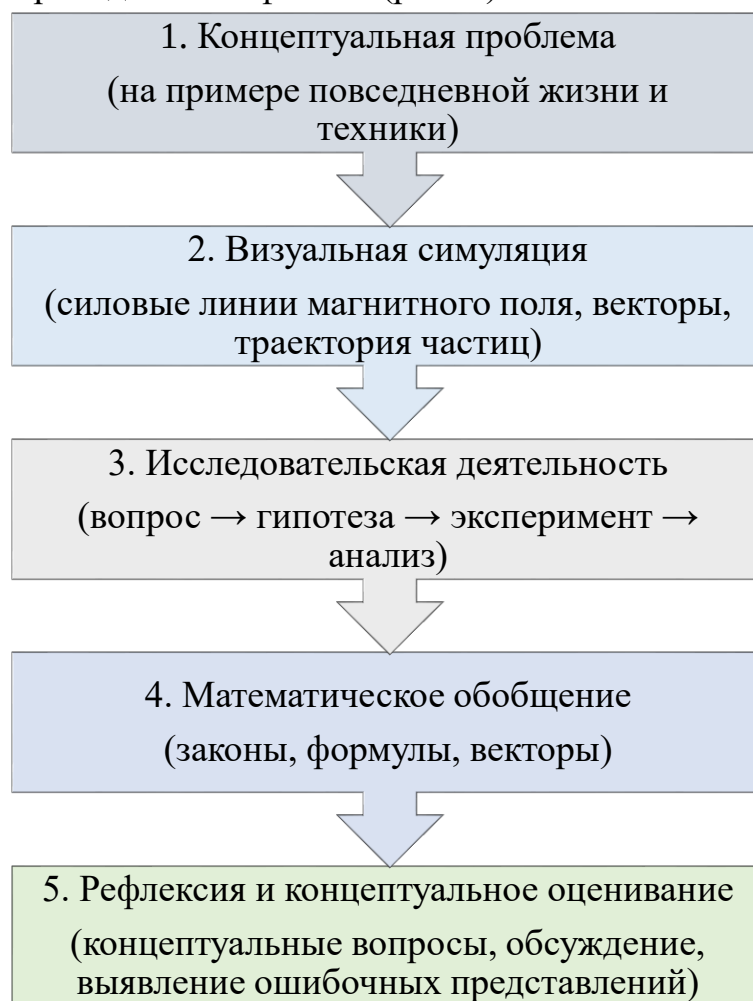


Рисунок 1. Интегрированная дидактическая модель.

Данная модель рассматривает обучение не как процесс передачи готовых знаний, а как активную познавательную деятельность студента. Она организует обучение в виде циклического процесса, объединяющего в единую дидактическую систему концептуальное понимание, визуальное восприятие, исследовательскую деятельность, математическое обобщение и рефлексия.

Первым компонентом модели является *концептуальная проблема*, которая формируется на основе реальных ситуаций, связанных с повседневной жизнью и техникой. На данном этапе активизируются предварительные знания студентов, создаётся когнитивный конфликт и формируется внутренняя мотивация к изучению новой темы.

Второй компонент - *визуальная симуляция* - предполагает динамическое представление линий магнитного поля, векторов и траекторий движения частиц с помощью моделей. Этот этап переводит абстрактное понятие поля в наглядную форму и способствует снижению ошибок, связанных с пространственным и векторным восприятием. Как показано на рисунке, данный этап напрямую связан с исследовательским процессом посредством механизма обратной связи.

Третий компонент представляет собой *исследовательскую деятельность*, в рамках которой студенты самостоятельно формируют знания через постановку вопросов, выдвижение гипотез, проведение экспериментов или симуляций и анализ полученных результатов. В случае если полученные результаты оказываются непонятными или противоречивыми, студент возвращается к этапу визуальной симуляции и повторяет исследование. Данный механизм отражает важную когнитивную обратную связь, заложенную в модели.

Четвёртый компонент - *математическое обобщение* - направлен на соотнесение концептуальных и экспериментальных результатов с физическими законами и математическими формулами. На этом этапе формулы интерпретируются не как готовая информация, а как логически обобщённое выражение понятий, сформированных на предыдущих этапах. В случае возникновения несоответствия между математической моделью и пониманием физического содержания осуществляется возврат к исследовательскому этапу для уточнения результатов.

Заключительным этапом модели является *рефлексия и концептуальное оценивание*, обеспечивающее оценку уровня понимания студентов посредством концептуальных вопросов, обсуждений и выявления ошибочных представлений. Именно на этом этапе формируется новая концептуальная проблема, после чего учебный процесс переходит к следующему циклу. Таким образом, модель обеспечивает непрерывный и развивающийся процесс обучения.

В целом предлагаемая интегрированная дидактическая модель объединяет в единую систему концептуальную проблему, визуализацию, исследовательскую деятельность, математическое обобщение и рефлекссию, аккумулируя все ключевые элементы, признанные эффективными в проанализированной научно-методической литературе [27-30].

5. Заключение и рекомендации

Проведённый анализ и эмпирические результаты показывают, что основные трудности в обучении темам магнитного поля связаны не столько с выполнением математических вычислений, сколько с осмыслением физического смысла понятия поля, при этом данные проблемы носят преимущественно концептуальный и методический характер. В ходе исследования было установлено, что студенты допускают устойчивые ошибки при определении направления магнитной силы, пространственном представлении векторных величин, а также при соотнесении выражения силы

Лоренца с реальными физическими процессами. Данная ситуация согласуется с результатами международных исследований и свидетельствует о том, что традиционное, формульно-ориентированное обучение является недостаточным для преодоления указанных затруднений.

Интегрированная, визуальная и исследовательски ориентированная дидактическая модель, предложенная в рамках данного исследования, позволила системно устранить выявленные проблемы. Результаты экспериментальной группы показали, что после проведения занятий на основе данной модели у студентов значительно улучшилось концептуальное понимание магнитных силовых линий, направлений векторов и движения частиц. В частности, по результатам концептуального тестирования средние показатели экспериментальной группы стабильно превышали показатели контрольной группы, при этом выявленные различия оказались статистически значимыми. Кроме того, возросла активность студентов в процессе обсуждения и рефлексии, сформировались умения самостоятельного выявления и коррекции ошибочных представлений.

Использование визуальных симуляций и виртуальных лабораторий позволило перевести понятие поля с абстрактного уровня на уровень пространственного и динамического восприятия, что способствовало активизации научного мышления студентов. Исследовательская деятельность, в свою очередь, обеспечила развитие у обучающихся компетенций постановки вопросов, выдвижения гипотез и формулирования выводов на основе доказательств. Этап математического обобщения способствовал более глубокому пониманию содержания формул и переходу от их механического применения к осознанному использованию.

На основе полученных результатов можно сформулировать ряд практических рекомендаций по обучению темам магнитного поля. Прежде всего, целесообразно преподавать данные темы не только через алгебраические формулы и расчётные задачи, но и на основе моделей поля, силовых линий и векторных представлений. Такой подход способствует формированию у студентов пространственного мышления и понимания причинно-следственных связей. Во-вторых, виртуальные лаборатории и компьютерные симуляции следует внедрять в учебный процесс не как вспомогательное средство, а как обязательный и системный компонент обучения. Такая среда создаёт условия для безопасного, воспроизводимого эксперимента с возможностью свободного изменения параметров. Наконец, в процессе оценивания рекомендуется не ограничиваться тестами, основанными исключительно на вычислениях, а использовать концептуальные вопросы, графический анализ и развернутые пояснительные ответы. Это позволяет более точно определить реальный уровень понимания студентов и оценить их способность к переносу усвоенных знаний в новые ситуации.

В целом интегрированный, визуальный и исследовательски ориентированный подход демонстрирует высокую эффективность в обучении

темам магнитного поля, способствуя не только улучшению учебных результатов, но и формированию у студентов устойчивого научного мышления и глубокого понимания физических явлений. В связи с этим представляется целесообразным широкое внедрение данной модели при преподавании раздела электромагнетизма в высших учебных заведениях.

Использованные источники:

1. Maloney, D. P., O'Kuma, T. L., Hieggelke, C. J., & Van Heuvelen, A. (2001). Surveying students' conceptual knowledge of electricity and magnetism. *American Journal of Physics*, 69(S1), S12-S23. <https://aapt.scitation.org/doi/10.1119/1.1371296>
2. McDermott, L. C., & Shaffer, P. S. (1992). Research as a guide for curriculum development: An example from introductory electricity. *American Journal of Physics*, 60(11), 994-1003. <https://aapt.scitation.org/doi/10.1119/1.17003>
3. Redish, E. F. (2003). *Teaching physics with the physics suite*. Wiley. <https://onlinelibrary.wiley.com/doi/book/10.1002/0471440007>
4. Viennot, L. (2001). *Reasoning in physics: The part of common sense*. Springer. <https://link.springer.com/book/10.1007/978-94-017-1677-5>
5. Guisasola, J., Almudí, J. M., & Zubimendi, J. L. (2004). Difficulties in learning the introductory magnetic field theory. *Science Education*, 88(3), 443-464. <https://onlinelibrary.wiley.com/doi/10.1002/sce.10119>
6. Bagno, E., & Eylon, B. (1997). From problem solving to a knowledge structure: An example from electromagnetism. *American Journal of Physics*, 65(8), 726-736. <https://aapt.scitation.org/doi/10.1119/1.18652>
7. Törnkvist, S., Pettersson, K.-A., & Tranströmer, G. (1993). Confusion by representation: On students' comprehension of the electric field concept. *American Journal of Physics*, 61(4), 335-338. <https://aapt.scitation.org/doi/10.1119/1.17268>
8. Singh, C. (2006). Student understanding of symmetry and Gauss's law. *American Journal of Physics*, 74(10), 923-936. <https://aapt.scitation.org/doi/10.1119/1.2218357>
9. Planinic, M. (2006). Assessment of difficulties of some conceptual areas from electricity and magnetism using CSEM. *Physical Review Physics Education Research*, 2, 010103. <https://journals.aps.org/prper/abstract/10.1103/PhysRevPER.2.010103>
10. Scaife, T. M., & Heckler, A. F. (2010). Interference between electric and magnetic concepts. *Physical Review Physics Education Research*, 6, 010106. <https://journals.aps.org/prper/abstract/10.1103/PhysRevPER.6.010106>
11. Kohl, P. B., & Finkelstein, N. D. (2006). Effects of representation on students solving physics problems. *Physical Review Physics Education Research*, 2, 010111. <https://journals.aps.org/prper/abstract/10.1103/PhysRevPER.2.010111>
12. Redish, E. F., & Smith, K. A. (2008). Looking beyond content: Skill development for engineers. *American Journal of Physics*, 76(10), 970-977. <https://aapt.scitation.org/doi/10.1119/1.2952271>

13. McDermott, L. C. (1991). What we teach and what is learned-Closing the gap. *American Journal of Physics*, 59(4), 301-315. <https://aapt.scitation.org/doi/10.1119/1.16539>
14. Heller, P., & Reif, F. (1984). Prescribing effective human problem-solving processes. *Cognitive Science*, 8(2), 175-209. https://onlinelibrary.wiley.com/doi/10.1207/s15516709cog0802_2
15. Hake, R. R. (1998). Interactive-engagement versus traditional methods. *American Journal of Physics*, 66(1), 64-74. <https://aapt.scitation.org/doi/10.1119/1.18809>
16. Wieman, C. E., & Perkins, K. K. (2005). Transforming physics education. *Physics Today*, 58(11), 36-41. <https://pubs.aip.org/physicstoday/article/58/11/36/387022>
17. Meltzer, D. E. (2002). The relationship between mathematics preparation and conceptual learning gains. *American Journal of Physics*, 70(12), 1259-1268. <https://aapt.scitation.org/doi/10.1119/1.1514215>
18. Perkins, K., Adams, W., Dubson, M., Finkelstein, N., Reid, S., & Wieman, C. (2006). PhET: Interactive simulations for teaching and learning physics. *The Physics Teacher*, 44(1), 18-23. <https://aapt.scitation.org/doi/10.1119/1.2150754>
19. Finkelstein, N. D., et al. (2005). When learning about the real world is better done virtually. *Physical Review Physics Education Research*, 1, 010103. <https://journals.aps.org/prper/abstract/10.1103/PhysRevPER.1.010103>
20. Adams, W. K., et al. (2008). A study of educational simulations Part I. *Journal of Interactive Learning Research*, 19(3), 397-419. <https://www.learntechlib.org/p/24200/>
21. Etkina, E., Murthy, S., & Zou, X. (2006). Using introductory labs to engage students in experimental design. *Physics Education*, 41(1), 1-7. <https://iopscience.iop.org/article/10.1088/0031-9120/41/1/001>
22. Holmes, N. G., Wieman, C. E., & Bonn, D. A. (2015). Teaching critical thinking. *Physical Review Physics Education Research*, 11, 010116. <https://journals.aps.org/prper/abstract/10.1103/PhysRevPER.11.010116>
23. Prince, M., & Felder, R. (2006). Inductive teaching and learning methods. *Journal of Engineering Education*, 95(2), 123-138. <https://onlinelibrary.wiley.com/doi/10.1002/j.2168-9830.2006.tb00884.x>
24. Mazur, E. (1997). *Peer instruction: A user's manual*. Prentice Hall. <https://www.pearson.com/en-us/subject-catalog/p/peer-instruction/P2000000006245>
25. Crouch, C. H., & Mazur, E. (2001). Peer instruction: Ten years of experience and results. *American Journal of Physics*, 69(9), 970-977. <https://aapt.scitation.org/doi/10.1119/1.1374249>
26. Lasry, N., Mazur, E., & Watkins, J. (2008). Peer instruction: From Harvard to the two-year college. *American Journal of Physics*, 76(11), 1066-1069. <https://aapt.scitation.org/doi/10.1119/1.2978182>
27. Hestenes, D. (2010). Modeling theory for math and science education. *American Journal of Physics*, 78(9), 965-980. <https://aapt.scitation.org/doi/10.1119/1.3497599>

28. Duit, R., & Treagust, D. F. (2012). Conceptual change: A powerful framework. Springer. <https://link.springer.com/book/10.1007/978-94-007-2153-8>
29. Freeman, S., et al. (2014). Active learning increases student performance. PNAS, 111(23), 8410-8415. <https://www.pnas.org/doi/10.1073/pnas.1319030111>
- Mulhall, P. J., & Gunstone, R. F. (2012). Views about learning physics held by physics teachers with differing approaches to teaching physics. Journal of Science Teacher Education, 23(5), 429-449. <https://link.springer.com/article/10.1007/s10972-012-9291-2>

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ИЗМЕНЕНИЕ МИКРОФЛОРЫ ЗЕРНА ПШЕНИЦЫ, ХРАНЯЩЕЙСЯ НА СКЛАДАХ, В ПОСЛЕУБОРОЧНЫЙ ПЕРИОД

Аннотация: Целью работы исследование микрофлоры зерна пшеницы, хранящихся на складах в послеуборочный период. Количество дрожжевых грибов и микроорганизмов, разрастающихся в закрытом складе, по данным КМАФАнМ (количество мезофильных аэробных и факультативно-анаэробных микроорганизмов), оказалось значительно выше, чем на открытой площадке и открытом складе. Образец, хранящийся в открытом грунте, был загрязнен КМАФАнМ в большей степени, чем другие образцы. Из образцов были выделены бактерии *Bacillus mesentericus*, *Bacillus subtilis*, *Bacillus cereus*, *Bacillus vallismortis*. Из неспорообразующих бактерий были обнаружены *Enterobacter cloacae*, *Enterobacter spp.* Все микроорганизмы проявляли типичные биологические признаки, свойственные их родам и видам. Микромицеты родов *Mucor*, *Aspergillus*, *Fusarium*, *Penicillium* были выявлены на среде Сабуро и Чапека, Дрожжи *S. cerevisiae* были выделены при росте на среде Сабуро. Полученные данные позволяют заключить, что условия хранения существенно влияют на развитие микроорганизмов, и в условиях жаркого климата необходимо строго соблюдать рациональные технологические режимы.

Ключевые слова: микрофлора зерна пшеницы, дрожжи и плесневые грибы, открытые и закрытые склады, контаминация зерна пшеницы

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CHANGES IN THE MICROFLORA OF WHEAT GRAIN STORED IN WAREHOUSES IN THE POST-HARVEST PERIOD

Abstract: The aim of the work is to study the microflora of wheat grain stored in warehouses during the post-harvest period. The number of yeast fungi and microorganisms growing in a closed warehouse, according to KMAFAnM data (count of mesophilic aerobic and facultative-anaerobic microorganisms), was significantly higher than on an open площадка and in an open warehouse. The sample stored in open ground was contaminated with KMAFAnM to a greater extent than the other samples. From the samples, the bacteria *Bacillus mesentericus*,

Bacillus subtilis, Bacillus cereus, Bacillus vallismortis were isolated. Among non-spore-forming bacteria, Enterobacter cloacae and Enterobacter spp. were detected. All microorganisms exhibited typical biological characteristics inherent to their genera and species. Micromycetes of the genera Mucor, Aspergillus, Fusarium, Penicillium were detected on Sabouraud and Czapek media. Yeasts S. cerevisiae were isolated during growth on Sabouraud medium.

Keywords: *wheat grain microflora, yeasts and molds, open and closed warehouses, wheat grain contamination.*

Введение

Пшеница (*Triticum* spp.) является одной из важнейших основных сельскохозяйственных культур, широко выращиваемой и все больше потребляемой во всем мире [1]. Поэтому потери пшеницы из-за различных вредителей и патогенов вызывают серьезную озабоченность. Болезнь выбивания всех культур является наиболее вредоносным корневым заболеванием пшеницы во всем мире [2].

Безопасность – важный показатель качества пищевых продуктов, отсутствие возможных элементов реакции внешних химических веществ, а также их метаболитов и ксенобиотиков с компонентами пищевого продукта, различными биологическими факторами. Это является неотъемлемым условием запрета на использование продуктов питания, оказывающих негативное воздействие на организм.

Недостаточная реализация программ безопасности пищевых продуктов питания, а также зерна приводит к вспышке заболеваний, связанных с сухими продуктами. Зерновые культуры могут быть загрязнены пищевыми патогенами на любом этапе производства, переработки, хранения и распределения. Еще до сбора урожая источникам загрязнения является почва, проникновение животных, загрязненное уборочное оборудование, обработка урожая и предуборочная обработка, условия хранения и другие. Предотвращение загрязнения – ключ к предотвращению рисков пищевых заболеваний[3].

Как известно, чем выше качество пищевых продуктов для удовлетворения физиологических потребностей организма, тем полнее сохраняются их пищевые и биологические свойства. Поэтому важно производить высококачественные пищевые продукты, одновременно стремясь к здоровью людей, потребляющих эти продукты. Оценка риска для здоровья – это количественный и качественный показатель вредных последствий, возникающих в результате специфического воздействия факторов загрязнения пищевых продуктов на человека или общество[4].

Как известно, Международная комиссия ФАО/ВОКОДЕКС АЛИМЕНТАРИУС (ИСО) создала международный механизм определения и оценки безопасности пищевых продуктов. Работа этого механизма направлена на гармонизацию различных национальных подходов к проблеме безопасности пищевых продуктов, технологии их приготовления и контроля

качества. Поэтому важным этапом обеспечения безопасности пищевых продуктов в Узбекистане является анализ, оценка и управление их риском для организма человека[5].

Патогенные грибы могут уничтожить пшеницу и продукты ее переработки как до, так и после сбора урожая, в период их производства и хранения. Тридцать образцов хранящегося зерна пшеницы были взяты с различных рынков города Мансура, мухафаза Дакахилия, Египета и проанализированы на наличие естественной плесени. В ходе данного исследования были идентифицированы роды *Alternaria*, *Aspergillus*, *Botryotrichum*, *Cladsporium*, *Fusarium*, *Penicillium*, *Rhizopus*, *Trichoderma* и *Ulocladium*. Наиболее распространенным обнаруженным родом грибов был *Aspergillus* (100%), за ним следует *Penicillium* (83,3%). Наиболее распространенными видами грибов были *Aspergillus niger*, *Aspergillus flavus*, *Rhizopus stolonifer*, *Alternaria alternata* и *Penicillium chrysogenum*. Проведенные исследования показали, что фермерам и предприятиям пищевой промышленности необходимо принимать более жесткие меры до и после сбора урожая, чтобы предотвратить или снизить образование микотоксинов в зерне пшеницы[6].

Зерновые продукты, составляющие основу рациона питания каждой страны, имеют большое значение в обеспечении продовольственной безопасности. Анализ потребления продуктов питания в мире показал, что 50% белков, 70% углеводов и 15% жиров поступают из злаков [7, 8].

Злаки содержат практически все из 400 необходимых организму человека питательных веществ в различных количествах. Установлено, что химический состав зерновых продуктов, их многочисленные компоненты – клетчатка, пектин, витамины Е и группы В, макро- и микроэлементы – выполняют восстанавливающую, защитную, предпатологическую и профилактическую функции в организме человека [9].

С микробиологической и микологической точки зрения доказано, что на поверхности зерна сохраняется небольшое количество эпифитной микрофлоры. Однако микроорганизмы попадают в зерно преимущественно во время уборки, с частицами пыли и почвы, и их количество может достигать 2×10^7 в 1 мл продукта. К таким микроорганизмам относятся картофельная палочка (*Bacillus mesentericus*), другие спорообразующие палочки, микрококки, плесневые грибы, бактерии группы кишечной палочки (ITGB), жирнокислые бактерии и другие. Установлено, что при повышении влажности зерна вследствие неправильного хранения численность микроорганизмов резко возрастает при измельчении, а при нарушении условий хранения продукт портится из-за роста плесневых грибов [10].

По данным исследований ФАО/ВОЗ, при хранении зерна по различным причинам масса зерна уменьшается на 10-15%, а качество хранящейся в нем продукции соответственно снижается [11]. Установлено, что отсутствие научного обоснования разрабатываемых технологических режимов хранения зернового сырья может привести к потере до 30% урожая [12, 13]. Доказано,

что несвоевременная очистка и некачественная обработка хранящегося зернового сырья приводят к потере 15–30% собранного урожая, а затраты на очистку и послеуборочную обработку составляют 30% себестоимости конечного продукта [14, 15]. Таким образом, основными факторами, влияющими на себестоимость готовой продукции, произведенной из зернового сырья, являются его обработка при хранении и создание оптимальных технологических режимов.

Как и другие растения, зерновая масса также содержит микроорганизмы. Микрофлора каждой зерновой массы включает различные группы микроорганизмов, такие как бактерии и грибы, а во многих образцах обнаружено присутствие актиномицетов и дрожжей [16].

Установлено, что большинство микроорганизмов зерновой массы являются сапрофитами, то есть метатрофами, которым необходимы различные органические соединения [17]. Показано, что некоторые представители этой группы при определенных условиях питаются органическим веществом зерна, изменяя его физические свойства и химический состав [18]. Установлено, что хранение убранной зерновой массы в научно обоснованном технологическом режиме практически не изменяет уровень обсемененности спорообразующими микроорганизмами. Однако установлено, что он может резко возрасти при ухудшении условий хранения, особенно при самосогревании зерна [19]. Установлено, что повышение температуры в зерновой массе до 45–55°C создает благоприятные условия для развития термофильных спорообразующих микробов, в результате чего численность спорообразующих микробов в 1 г зерна и зернопродуктов достигает 1×10^4 КОЕ/мл. Доказано, что это состояние зависит от влажности зерна [20, 21].

Опасным компонентом зерновой массы являются поврежденные и испорченные в результате самосогревания зерна, в котором образуются спорообразующие микроорганизмы.

Возбудитель фитофтороза картофеля *Bacillus mesentericus* – грамположительная аэробная палочка, широко распространённая в окружающей среде: в воздухе, почве, растениях и грибах. Установлено, что она хорошо прорастает при температуре 33–42 °C и не прорастает при температуре 18 °C и ниже. Установлено, что активное расщепление белков придаёт продуктам неприятный резкий запах, а продукты распада углеводов, в частности крахмала, делают поверхность продукта липкой и склизкой. Другие сапрофиты, обнаруженные в микрофлоре зерна, – это микроорганизмы, попадающие из почвы на поверхность зерна во время уборки и транспортировки, включая *Bacillus subtilis* (сенная палочка, возбудитель болезней хлеба), *Bacillus mycoides* (гнилостная палочка), *Bacillus proteus* (гнилостная палочка), кислотообразующие бактерии, кокки, микрококки и сарцины [22, 23, 24, 25, 26].

Было показано, что дрожжи размножаются на поверхности зерна, но не оказывают существенного влияния на его сохранность и качество [24], однако

при определенных условиях они вызывают накопление тепла в зерновой массе, вызывая «запах амбара» [27]. Плесневые грибы обнаруживаются в виде спор в свежееубранном зерне, и их количество составляет 1-2% от общего числа микроорганизмов [28, 29]. Изучено, что плесневые грибы могут появляться во время уборки зерна во влажную погоду, в нижней части зернового вороха на складах, а также при транспортировке зерна водным или железнодорожным транспортом [27]. Установлено, что их интенсивный рост всегда приводит к потерям сухого вещества зерна, снижению качества зерна или его полной гибели [30].

Доказано, что гифы плесневых грибов способны проникать в оболочку и эндосперм зерна, делая его совершенно непригодным в качестве пищевого продукта [31]. Их насчитывается более 60 видов, и установлено, что наибольшее влияние на сохранность зерна оказывают *Aspergillus* и *Penicillium* [30]. Анализ вышеприведенных исследований показал, что температура 33–55 °С является благоприятной средой для быстрого развития микроорганизмов, приводящих к снижению сохранности, физико-химических и технологических показателей зерновой массы и ускорению процесса старения получаемых из них продуктов при хранении. Показано, что зерно пшеницы, выращенное в Узбекистане, хранящееся на открытых складах в течение 100-150 дней после сбора урожая, позволяет развиваться спорообразующим бактериям.

Целью исследования являлось изучение микрофлоры зерна пшеницы, хранящегося на складах в период послеуборочного дозревания, и ее влияние на микробиологическую безопасность.

Материалы и методы исследования. Микрофлору образцов зерна пшеницы, отобранных для исследования, анализировали на соответствие стандартам для пищевых продуктов, принятым Международной комиссией Codex Alimentarius и SanQvaM0366-19. T-2019, в лабораториях кафедры микробиологии, вирусологии и иммунологии Бухарского медицинского института и кафедры бактериологии Бухарского областного управления санитарно-эпидемиологической службы здравоохранения [32, 33]. Стерилизацию тары, из которой отбирались пробы, и необходимых материалов проводили согласно ГОСТ 25375-82 [34]. Количество спорообразующих микроорганизмов в зерне и муке определяли согласно ГОСТ Р51278-99 [35]. Анализ численности мезофильных аэробных и факультативно анаэробных микроорганизмов (КМАФАнМ) проводили согласно ГОСТ 10444.12-88 [36].

В качестве материала исследования было отобрано 200 кг зерна пшеницы урожая 2024 года, полученного предприятием АО «Дон Халк Ризки». Образец был разделен на две части, и в качестве объекта исследования были выбраны пробы из зернового вороха, хранившегося в лаборатории пищевых технологий Шахрисабзского филиала Ташкентского химико-технологического института в открытых и закрытых помещениях, а также на открытой площадке территории предприятия АО «Дон Халк Ризки» (рис. 1).



Рисунок 1. Образцы зерна пшеницы, отобранные для исследования. Хранение на открытом складе (1), на закрытом складе (2) и на открытой площадке территории мельницы (3).

Зерно пшеницы. Пробы из вороха отбирали в стерильные пластиковые контейнеры по ГОСТ 25375-82. Образцы также доставляли в бактериологические лаборатории для микробиологических и микологических исследований.

Для обеспечения объективности и достоверности результатов исследования определялся спектр состава спорообразующих микроорганизмов, обнаруженных в зерновом ворохе (до $0,1-1 \cdot 10$ КОЕ/г). Для этого готовили исходную суспензию и ее 10-кратное разведение по ГОСТ 26669-85. Брели 10 г зерна пшеницы, помещали в 90 мл пептонно-солевого раствора, перемешивали, оставляли на 10 минут и интенсивно встряхивали еще 1 минуту (рис. 2).

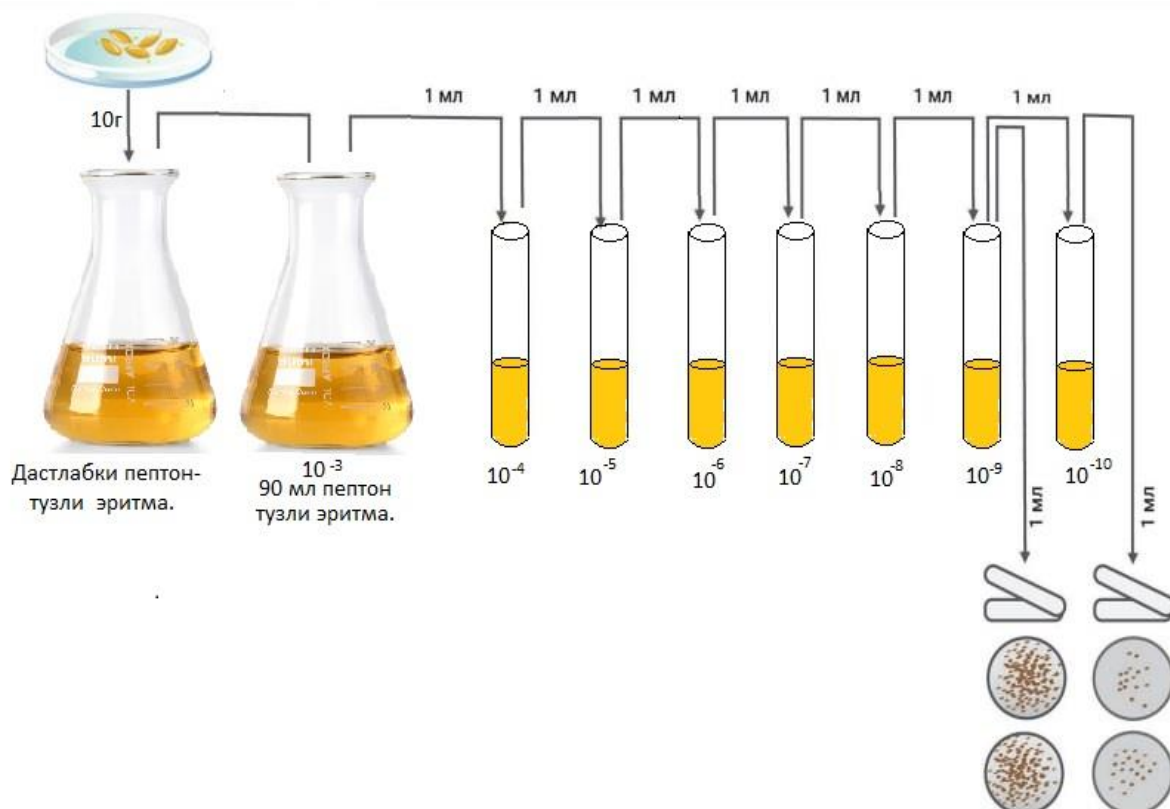


Рисунок 2. Схема приготовления разведений для определения спектра спорообразующих микроорганизмов в зерновой массе (согласно ГОСТ 26669-85).

Изучение микрофлоры зерна пшеницы проводили традиционными микробиологическими и микологическими методами [5, 18]. Идентификацию и дифференциацию микроорганизмов проводили согласно «Руководству по систематической бактериологии» Берджи [1997]. Для исследования присутствия бактерий в образцах посев производили на среду мясо-пептонный агар, для выявления грибов и дрожжей использовали питательные среды (среды Сабуро и Чапека (фирмы «HiMedia» Индия). При организации и проведении исследования строго соблюдались правила биологической безопасности.

Статистическая обработка полученного материала проводилась традиционными методами вариационной статистики. Статистический анализ проводился на персональном компьютере на базе процессора Pentium IV с использованием пакета программ для медико-биологических исследований (программа Excel).

Результаты и обсуждение исследования.

Результаты определения микрофлоры образцов зерна пшеницы представлены в таблице 1. Как показывают данные, приведенные в таблице, условия хранения зерна пшеницы не повлияли на количественные показатели плесневых грибов и практически не изменились. Численность плесневых грибов на открытой площадке предприятия, в открытых и закрытых складах

соответственно незначительно снизилась, а полученные показатели достоверно не отличались друг от друга при сравнении ($P>0,05$).

Микробиологические показатели образцов зерна пшеницы

Образцы зерна пшеницы, хранившиеся в период послеуборочного созревания	Микробиологические показатели, КОЕ/мл		
	Бактерии	Дрожжи	Грибы
На открытой площадке предприятия	5×10^7	$1,2 \times 10^6$	10×10^3
На открытом складе	4×10^7	$1,2 \times 10^6$	10×10^3
На закрытом складе	$3,8 \times 10^7$	9×10^5	10×10^3

Результаты, полученные для дрожжей и КМАФАнМ, несколько различались. В обоих случаях установлено, что численность микроорганизмов, выращенных в закрытом складе (9×10^5 КОЕ/мл и $3,8 \times 10^7$ КОЕ/мл), была достоверно выше показателей открытой площадки предприятия (12×10^5 и 5×10^7 КХБ/мл) и открытого склада (12×10^5 и 4×10^7 КОЕ/мл).

Таким образом, место хранения зерна пшеницы не оказывало влияния на количественные показатели плесневых грибов и достоверно не отличались друг от друга. Установлено, что численность дрожжевых грибов и микроорганизмов, выращенных в закрытом складе КМАФАнМ, достоверно выше показателей открытой площадки предприятия и открытого склада. Образец, хранившийся на открытой площадке предприятия, показал более высокий уровень контаминации по количеству КМАФАнМ по сравнению с другими образцами. Высокий уровень контаминации объясняется наличием пыли, образующейся при переработке зерна на мельнице.

Для определения закономерностей влияния мукомольных предприятий и открытых складов на уровень контаминации спорообразующими бактериями вороха пшеницы целесообразно изучить взаимосвязь между пылью в этом ворохе и поверхностью зерна пшеницы.

В результате исследования установлено, что в исследованных зернах пшеницы были обнаружены микроорганизмы, относящиеся к разным родам и видам (рис. 3).

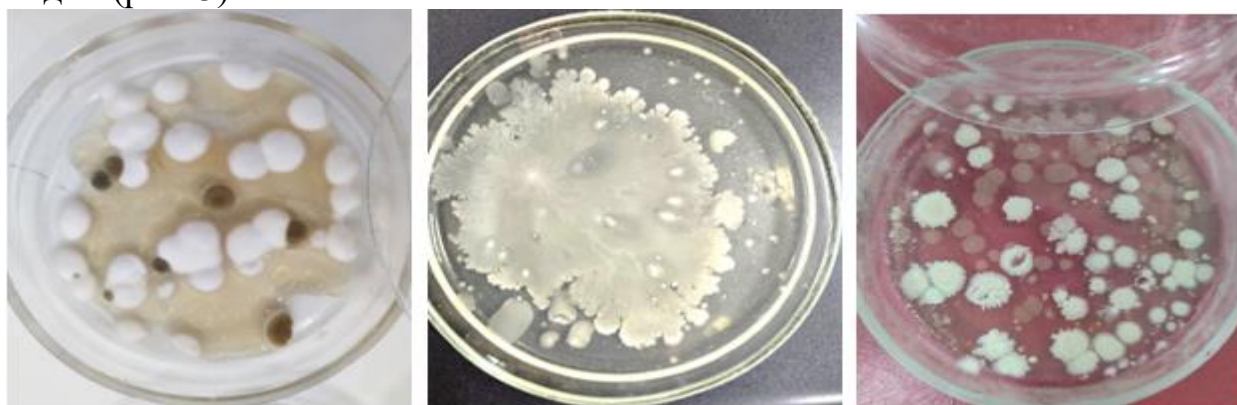


Рис. 3. Проращение колоний из образца зерен пшеницы, выросшие на мясопептонной среде

Установлено, что численность и разнообразие микроорганизмов зависят от условий хранения зерна пшеницы. Показано, что колонии, выросшие на мясо-пептонной среде относятся к спорообразующим микроорганизмам рода *Bacillus* – *Bacillus mesentericus*, *Bacillus subtilis*, *Bacillus cereus*, *Bacillus vallismortis*. Среди неспорообразующих бактерий наиболее часто встречались *Enterobacter cloacae*, *Enterobacter spp.* Все микроорганизмы проявляли типичные биологические признаки, свойственные их родам и видам.

В результате микологических исследований на среде Сабуро выявлены грибы родов *Mucor*, *Aspergillus*, *Fusarium*, *Penicillium* (рис. 4).



Рисунок 4. Колонии грибов, выросших из образца зерен пшеницы на среде Сабуро

Полученные в чистом виде грибы были идентифицированы до рода по морфологическим, культуральным, ферментативным и другим биологическим признакам.

На среде Сабуро выросла 1 колония дрожжей. После очистки колонии была проведена идентификация по изучению биологических признаков и установлена принадлежность к *Saccharomyces cerevisiae*.

Образцы зерен пшеницы были также посеяны на среду Чапека



Рис. 5. Колонии грибов образцов зерен пшеницы, посеянные на среду Чапека

Как видно из рисунка 5, выявленные колонии грибов являются типичными для родов *Penicillium*, *Aspergillus*, *Fusarium*

7. Выводы

Количественные показатели плесневых грибов не зависели от условий хранения.

Уровень дрожжей и КМАФАнМ был выше в закрытых складах.

Наибольшее загрязнение зерна выявлено на открытой площадке предприятия.

Выявлены микроорганизмы родов *Bacillus*, *Enterobacter*, *Mucor*, *Aspergillus*, *Fusarium*, *Penicillium*, *Saccharomyces*.

В условиях жаркого климата для сохранения качества зерна необходимы рациональные режимы хранения.

Использованные источники:

1. Shewry, P.R. · Hey, S.J. The contribution of wheat to human diet and health, *Food Energy Secur.* 2015; **4**:178-202
2. Freeman, J. · Ward, E. *Gaeumannomyces graminis*, the take-all fungus and its relatives, *Mol. Plant Pathol.* 2004; **5**:235-252
3. Pardeepinder K. Brar, Michelle D. Danyluk. Nuts and Grains: Microbiology and Preharvest Contamination Risks // *ASM Journals Microbiology Spectrum*, 2018, Vol. 6, No. 2, <https://doi.org/10.1128/microbiolspec.pfs-0023-2018>
4. Нуралиев Н.А. Ген-модификацияланган маҳсулотнинг организмга таъсири ва тиббий-биологик хавфсизлигини баҳолаш асослари. Монография. – Бухоро, “Дурдона” нашриёти, 2024. – 216 б.
5. Руководство по процедуре Комиссии Codex Alimentarius, 21 - издание. – Рим, 2013. – 237 с.
6. Manar M. Abdel Gwad* ¹; Gamal M. Abdel-Fattah¹; Ashraf S.A. El-Sayed²; Mohammed A. Attia¹. Natural occurrence of fungi in stored wheat grains in Egypt. *Mansoura Journal of Biology* Volume 69, Issue 2, June 2024, Pages 18-26 _DOI: [10.21608/mjb.2024.446694](https://doi.org/10.21608/mjb.2024.446694)
7. Acquisgrana M.D.R., Gomez Pamies L.C., Martinez Amezaga N.M.J., Quiroga F.M., Ribotta P.D., Benítez E.I. Impact of moisture and grinding on yield, physical, chemical and thermal properties of wholegrain flour obtained from hydrothermally treated sorghum grains // *Int. J. Food Sci. Technol.* – 2020. - N55. - P.2901-2909.
8. Груданов В.Я., Пашкова Е.С., Расолько Л.А. Основы рационального питания: учебное пособие. – Минск: БГАТУ, 2016. – 256 с.
9. Исхакова Х.И., Дусчанов Б.А., Нуралиев Н.А. Микробиология и микробиологический контроль пищевых продуктов. Руководство для врачей. Часть I. – Ташкент, 2004. – 151 с.
7. Арынгазин К.Ш., Изтаев А.И., Джаикуразов Б.О. Научно-практические основы технологического проектирования зерновых элеваторов с элементами САПР: монография. - Алматы, Эверо, 2015. - 176 с.
8. Артыклыев Э., Байрамов А., Гараджаев Ш. Изменение химического состава зерна при созревании // *Инновационная наука*. - 2023. - № 12-2. - С.77-79.
9. Ваншин В.В. Хранение зерна и пищевых продуктов. Часть 1.

Характеристика зерновой массы, микрофлоры зерна и вредителей хлебных запасов: учебное пособие. - Оренбург: ОГУ, 2017. - 202 с.

10.Красникова Л.В., Гунькова П.И., Савкина О.А. Общая и пищевая микробиология: Учебное пособие. Часть II. - СПб.: Университет ИТМО, 2016. - 127 с.

11. Джей Дж.М., Лёсснер М.Дж., Гольден Д.А. Современная пищевая микробиология; перевод 7-го английского издания. - Москва: БИНОМ. Лаборатория знания. - 2011. - 86 с.

12. Львова Л.С., Яицких А.В. Источники загрязнения зерна спорообразующими бактериями - возбудителями «картофельной» болезни хлеба // Хлебопродукты. - 2013. - №9. - С.57-59.

13.Юсупова О.А., Сидорова О.Л., Тарутина Р.Д., Поландока О.В. Микробиологический контроль на хлебопекарных предприятиях. - Москва: ГОСНИИХП, Московская типография №2. - 2008. - 334 с.

14.Юсупов Р.Х., Матвеев Б.А. Картофельная болезнь хлеба и способы её предупреждения // Материалы XLII научно-технической конференции ЧГАУ. - Москва, 2003. - С.374.

15.Костро Е.И., Кондратьева С.М., Шленская Т.В. Борьба с потерями зерна путем снижения его зараженности. Элеваторная промышленность // Экспресс-информация. - М.: ЦНИИТЭИ хлебопродуктов. - 1986. - С. 15-18.

16.Volavsek P. J. A., Kirshner L. A. M., von Holy A. Accelerated method to predict the rope-inducing potential of bread raw materials // S. Afr. J. Sci. - 1992. - Vol 87. - P. 99-102.

17. Das Alokesh & Mandal, Subrata & Nag, Sudipa & Mondal, Bholanath. Management of Storage Pathogens of Cereal Grains: A Review // International Journal of Economic Research. - 2021. - N 8. - P.103-108.

18.Исхакова Х.И., Нуралиев Н.А. Микробиология и микробиологический контроль пищевых продуктов. Руководство для врачей. Часть II. - Ташкент, 2012. - 150 с.

19. Jorge M., Carlos M.M., Luis O., Marcela Calabi-Floody, María E.G., Sebastián M., Fernando B., Pablo C. Influence of saprophytic fungi and inorganic additives on enzyme activities and chemical properties of the biodegradation process of wheat straw for the production of organo-mineral amendments // Journal of Environmental Management. - 2020. - Vol. 255. - 109922.

20.Yi, Y., Hou, Z., Shi, Y., Zhang, C., Zhu, L., Sun, X., Zhang, R., & Wang, Z. *Pseudomonas fluorescens* RB5 as a Biocontrol Strain for Controlling Wheat Sheath Blight Caused by *Rhizoctonia cerealis* // Agronomy. - 2023. - N 13(8).

21. Vaičiulytė-Funk, Lina & Žvirdauskienė, Renata & Šalomskienė, Joana & Sarkinas, Antanas. The effect of wheat bread contamination by the Bacillus genus bacteria on the quality and safety of bread // Zemdirbyste. - 2015. - N 102. - P. 351-358.

22.Sandulachi E., Bulgaru V., Ghendov-Mosan A. and Sturza R. Controlling the Risk of Bacillus in Food Using Berries // Food and Nutrition Sciences. - 2021. - N 12. - C.557-577.

23. Wen J., Smelt J.P.P.M., Vischer N.O.E., de Vos A.L., Setlow P., Brul S. Heat Activation and Inactivation of Bacterial Spores: Is There an Overlap? // Appl Environ Microbiol. – 2022. – Vol. 8. – N 88(5). - e0232421.
24. Zavorohina Natalia & Pankratyeva Natalia & Goncharova Nadezhda. Development of an express method for the quantitative assessment of the contamination of wheat flour with Bac. spores. Subtilis // E3S Web of Conferences. - 2020. – N 222. - 06029.
25. Marcos Valle F.J., Castellari C., Yommi A., Pereyra M.A., Bartosik R. Evolution of grain microbiota during hermetic storage of corn (Zea mays L.) // Journal of Stored Product Research. - 2021. – N 92. - 101788.
26. Luis Sabillón, Jayne Stratton, Devin J. Rose, Teshome H. Regassa, Andréia Bianchini. Microbial Load of Hard Red Winter Wheat Produced at Three Growing Environments across Nebraska, USA // Journal of Food Protection. – 2016. – P. 646-654.
27. Lorenzo J.M., Munekata P.E., Dominguez R., Pateiro M., Saraiva J.A., Franco D. Main Groups of Microorganisms of Relevance for Food Safety and Stability: General Aspects and Overall Description // Innovative Technologies for Food Preservation. – 2018. – P.53-107.
28. Palma-Guerrero J., Chancellor T., Spong J., Canning G., Hammond J., McMillan V. E., & Hammond Kosack K.E. Take-All Disease: New insights into an important wheat root pathogen // Trends in Plant Science. - 2021. – N 26(8). – P.836-848.
29. Los A., Ziuzina D., & Bourke P. Current and future technologies for microbiological decontamination of cereal grains // Journal of Food Sciences. - 2018. – N 83.– P.1484-1493.
30. Marcus Schmidt, Stefan Horstmann, Lorenzo De Colli, Martin Danaher, Karl Speer, Emanuele Zannini, Elke K. Arendt. Impact of fungal contamination of wheat on grain quality criteria // Journal of Cereal Science. – 2016. – P.95-103.
31. Bullerman L.B., & Bianchini A. Food safety issues and the microbiology of cereals and cereal products. In N. Heredia, I. Wesley, & S. Garcia (Ed.). Microbiologically safe foods. - 2009. - p.315-335.
32. Bala B.K. Temperature and moisture changes during storage. In: B. K., Bala, (Ed.). Drying and storage of cereal grains. 2016. - p.223-262.
33. Санитарные правила, нормы и гигиенические нормативы Республики Узбекистан. Гигиенические нормативы безопасности пищевой продукции. СанПиН № 0366-19. Т-2019.
34. ГОСТ 25375-82. Тиббий асбобларни стерилизация ва дезинфекция қилиш усуллари, воситалари ва режимлари.
35. ГОСТ Р 51278-99. Дон, дуккакли экинлар ва уларнинг маҳсулотлари. Бактериялар, ачитқилар ва моғорларнинг сонини аниқлаш.
36. ГОСТ 10444.12-88. Нон маҳсулотларида моғор ва ачитқилар мавжудлигини аниқлаш.

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МОЛЕКУЛЯРНАЯ КОММУТАЦИЯ КАК НОВЫЙ МЕХАНИЗМ ХРАНЕНИЯ И ПЕРЕДАЧИ ИНФОРМАЦИИ В НУКЛЕИНОВЫХ КИСЛОТАХ

Аннотация: В статье рассматривается концепция молекулярной коммутации как фундаментального механизма хранения и передачи информации в нуклеиновых кислотах, сформулированного в научных исследованиях XXI века. Данный подход расширяет классическое представление о функциях ДНК, согласно которому биологическая информация передаётся исключительно посредством комплементарного спаривания оснований в двойной спирали. Экспериментальные данные демонстрируют возможность информационного взаимодействия между молекулами нуклеиновых кислот без образования стабильных двойных цепей. Молекулярная коммутация открывает новые перспективы для понимания молекулярных основ жизни, а также для развития биотехнологий, синтетической биологии и систем хранения информации на основе ДНК.

Ключевые слова: молекулярная коммутация, ДНК, нуклеиновые кислоты, молекулярные основы жизни, хранение информации, неклассические взаимодействия, молекулярная биология, биофизика.

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**Molecular Commutation as a New Mechanism
of Information Storage and Transmission in Nucleic Acids**

MOLECULAR COMMUTATION AS A NEW MECHANISM OF INFORMATION STORAGE AND TRANSFER IN NUCLEIC ACIDS

Abstract: The article examines the concept of molecular commutation as a fundamental mechanism for the storage and transmission of information in nucleic acids, as formulated in scientific research of the 21st century. This approach expands the classical understanding of DNA functions, according to which

biological information is transmitted exclusively through complementary base pairing within the double helix. Experimental data demonstrate the possibility of informational interactions between nucleic acid molecules without the formation of stable double strands. Molecular commutation opens new perspectives for understanding the molecular foundations of life, as well as for the development of biotechnology, synthetic biology, and DNA-based information storage systems.

Keywords: *molecular commutation, DNA, nucleic acids, molecular foundations of life, information storage, non-classical interactions, molecular biology, biophysics.*

Введение. Молекулярная коммутация представляет собой один из современных подходов к пониманию того, каким образом биологическая информация может храниться и передаваться в клетке помимо классического генетического кода. В традиционной молекулярной биологии нуклеиновые кислоты, прежде всего ДНК и РНК, рассматриваются как линейные молекулы, в которых информация записана в виде последовательности нуклеотидов. Считалось, что именно эта последовательность полностью определяет наследственные свойства организма, а передача информации осуществляется через репликацию ДНК и синтез РНК и белков. Однако исследования последних десятилетий показали, что такая модель является неполной и не отражает всей сложности процессов, происходящих в живой клетке.

Было установлено, что нуклеиновые кислоты обладают способностью изменять свою пространственную структуру, переходя из одного состояния в другое в зависимости от условий окружающей среды, наличия определённых молекул, ионного состава или взаимодействия с белками. Эти структурные переходы носят обратимый характер и могут существенно влиять на функциональное состояние молекулы. Именно эта способность к обратимым переключениям между различными состояниями и получила название молекулярной коммутации.

Если рассматривать молекулярную коммутацию в самом общем виде, то её можно описать как процесс, при котором одна и та же молекула нуклеиновой кислоты может находиться в нескольких устойчивых или полустойчивых формах, каждая из которых соответствует определённому функциональному состоянию. При этом первичная структура, то есть последовательность нуклеотидов, остаётся неизменной. Меняется не текст генетической информации, а способ её «прочтения» и реализации клеткой. ДНК, несмотря на кажущуюся простоту своей структуры, не является жёсткой и неизменной молекулой. Она способна принимать различные пространственные формы. Наиболее известной является В-форма ДНК, которая описана в большинстве учебников и считается основной формой двойной спирали в клетке. Однако в определённых условиях ДНК может переходить в А-форму или Z-форму, отличающиеся геометрией спирали, плотностью упаковки и ориентацией оснований. Эти переходы не являются случайными и часто связаны с регуляцией активности генов. Таким образом,

сама форма ДНК может нести дополнительную информацию, влияя на то, будет ли данный участок генома активен или подавлен.

РНК обладает ещё большей структурной пластичностью, чем ДНК. В отличие от ДНК, РНК чаще всего является одноцепочечной молекулой, что позволяет ей образовывать множество внутримолекулярных связей и формировать сложные пространственные структуры. Одна и та же молекула РНК может сворачиваться по-разному, образуя альтернативные структуры, каждая из которых соответствует определённому функциональному состоянию. Переход между такими структурами может происходить быстро и обратимо, что делает РНК удобным инструментом для реализации молекулярной коммутации.

Особенно наглядным примером молекулярной коммутации являются рибосвитчи. Рибосвитчи представляют собой участки молекул информационной РНК, способные напрямую связывать небольшие молекулы, такие как метаболиты или ионы. При связывании такой молекулы структура РНК изменяется, что приводит либо к включению, либо к выключению синтеза белка. В данном случае РНК одновременно выполняет роль сенсора, регулятора и переключателя, что наглядно демонстрирует, что нуклеиновые кислоты могут самостоятельно управлять потоками информации в клетке.

Молекулярная коммутация тесно связана с эпигенетическими механизмами регуляции. Эпигенетика изучает наследуемые изменения активности генов, которые не связаны с изменением последовательности ДНК. Одним из таких механизмов является метилирование ДНК. Добавление метильных групп к определённым основаниям изменяет физико-химические свойства молекулы ДНК и её способность взаимодействовать с регуляторными белками. В результате один и тот же ген может находиться в активном или неактивном состоянии. Эти состояния могут сохраняться при делении клеток, что позволяет рассматривать их как особую форму молекулярной памяти. Помимо ДНК, эпигенетическим модификациям подвергается и РНК. В последние годы было показано, что РНК содержит большое количество химических модификаций, которые влияют на её стабильность, скорость деградации и эффективность трансляции. Эти модификации могут изменяться в зависимости от физиологического состояния клетки, тем самым формируя динамическую систему регуляции. С точки зрения молекулярной коммутации такие модификации можно рассматривать как переключатели, изменяющие функциональное состояние РНК. С физико-химической точки зрения молекулярная коммутация основана на изменении энергетического ландшафта молекулы. Каждое структурное состояние соответствует определённому минимуму свободной энергии. Переход между состояниями возможен при наличии внешнего воздействия, например изменения температуры, концентрации ионов или связывания специфической молекулы. Эти переходы происходят без разрыва ковалентных связей, что обеспечивает их обратимость и высокую скорость.

Современные исследования также указывают на возможную роль квантово-физических эффектов в процессах молекулярной коммутации. Рассматриваются такие явления, как протонные переходы и таутомерные перестройки азотистых оснований, которые могут временно изменять свойства спаривания нуклеотидов. Хотя данные механизмы ещё недостаточно изучены, предполагается, что они могут вносить вклад в тонкую настройку процессов хранения и передачи информации.

С точки зрения информационной теории молекулярная коммутация существенно увеличивает информационную ёмкость нуклеиновых кислот. Если в классической модели информация ограничена линейной последовательностью нуклеотидов, то в случае коммутации учитываются также структурные состояния, химические модификации и динамические переходы между ними. Это позволяет одной и той же молекуле ДНК или РНК кодировать значительно больше информации, чем предполагалось ранее.

Биологическое значение молекулярной коммутации особенно хорошо прослеживается в процессах развития и дифференцировки клеток. Клетки организма имеют одинаковый геном, однако выполняют разные функции. Это возможно благодаря тому, что в каждой клетке активируются разные наборы генов, что во многом определяется коммутационными и эпигенетическими механизмами. Аналогичные процессы наблюдаются в нервной системе, где динамическая регуляция экспрессии генов играет важную роль в обучении и памяти.

Нарушения механизмов молекулярной коммутации могут приводить к развитию различных заболеваний. Изменения в эпигенетическом состоянии генома ассоциированы с онкологическими процессами, нарушениями развития и нейродегенеративными заболеваниями. Это делает изучение молекулярной коммутации важным направлением современной медицины и биологии.

Заключение. Таким образом, молекулярная коммутация представляет собой новый фундаментальный механизм хранения и передачи информации в нуклеиновых кислотах. Экспериментальные исследования XXI века убедительно демонстрируют, что ДНК и РНК способны участвовать в информационных процессах не только через классическое комплементарное спаривание, но и посредством слабоаффинных и обратимых молекулярных взаимодействий. Открытие молекулярной коммутации углубляет понимание молекулярных основ жизни и подтверждает сложность и многоуровневость биологических информационных систем. Практическое значение данного направления связано с перспективами создания новых биомолекулярных вычислительных систем, инновационных методов хранения данных и развития синтетической биологии. В совокупности это подчёркивает ключевую роль нуклеиновых кислот как универсальных носителей и процессоров информации в живых системах.

Использованные источники:

1. Альбертс Б., Джонсон А., Льюис Дж., Морган Д., Рафф М., Робертс К., Уолтер П. Молекулярная биология клетки. — 6-е изд. — Москва: Лаборатория знаний, 2016.
2. Уотсон Дж., Бейкер Т., Белл С., Ганн А., Левин М., Лосик Р. Молекулярная биология гена. — Москва: БИНОМ. Лаборатория знаний, 2014.
3. Лодиш Х., Берк А., Кайзер К., Кригер М., Брэтчер А., Плоэг Х., Амон А., Скотт М. Молекулярная клеточная биология. — Москва: БИНОМ, 2017.
4. Франк-Каменецкий М. Д. Самая главная молекула. От структуры ДНК к биологии XXI века. — Москва: Альпина нон-фикшн, 2019.
5. Никитин М. П. Неклассические механизмы информационных взаимодействий нуклеиновых кислот // Успехи химии. — 2010. — Т. 79, № 1. — С. 3–22.
6. Никитин М. П., Ткачев В. Ю. Физико-химические основы информационных процессов в ДНК // Биофизика. — 2012. — Т. 57, № 4. — С. 675–689.
7. Брекер Р. Р. Рибосвитчи и регуляторные функции РНК // Молекулярная биология. — 2013. — Т. 47, № 2. — С. 187–201.
8. Шарп П. Центральная роль РНК в регуляции клеточных процессов // Успехи биологической химии. — 2010. — Т. 50. — С. 121–138.
9. Бёрд А. Современные представления об эпигенетике // Генетика. — 2008. — Т. 44, № 6. — С. 749–758.
10. Яниш Р., Бёрд А. Эпигенетическая регуляция экспрессии генов // Молекулярная биология. — 2004. — Т. 38, № 4. — С. 541–552.
11. Карелл Т., Курц М., Мюллер М. Неканонические основания ДНК как дополнительный уровень генетической информации // Биохимия. — 2019. — Т. 84, № 9. — С. 1045–1060.
12. Гилберт У. Концепция «РНК-мира» и её значение для молекулярной биологии // Природа. — 1987. — № 3. — С. 15–23.

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РОЛЬ РУССКОГО ЯЗЫКА В ОСВОЕНИИ ЭКОНОМИЧЕСКИХ ДИСЦИПЛИН И ПРОФЕССИОНАЛЬНОЙ ТЕРМИНОЛОГИИ

Аннотация. В данной статье рассматривается роль русского языка в процессе освоения экономических дисциплин и формирования профессиональной терминологии у студентов экономических специальностей. Анализируется значение русского языка как языка науки, образования и профессионального общения, обеспечивающего доступ к теоретическим знаниям, учебным материалам и научным источникам в области экономики. Особое внимание уделяется влиянию языковой подготовки на качество усвоения экономических понятий, категорий и моделей, а также на развитие экономического мышления и аналитических навыков обучающихся.

В статье подчёркивается значение русского языка в условиях многоязычного образовательного пространства, где он выступает средством межнационального и профессионального взаимодействия. Отмечается его роль в стандартизации и систематизации экономической терминологии, что способствует точности профессионального общения и снижению рисков искажения экономического смысла. Рассматривается влияние владения русским языком на профессиональную подготовку будущих экономистов, их конкурентоспособность на рынке труда и способность к эффективной коммуникации в сфере экономики и финансов.

Ключевые слова: русский язык, экономическое образование, экономические дисциплины, профессиональная терминология, язык науки, профессиональная коммуникация.

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THE ROLE OF THE RUSSIAN LANGUAGE IN THE DEVELOPMENT OF ECONOMIC DISCIPLINES AND PROFESSIONAL TERMINOLOGY

Annotation. *This article examines the role of the Russian language in the process of mastering economic disciplines and the formation of professional terminology among students of economic specialties. The article analyzes the importance of the Russian language as the language of science, education and professional communication, providing access to theoretical knowledge, educational materials and scientific sources in the field of economics. Special attention is paid to the impact of language training on the quality of assimilation of economic concepts, categories and models, as well as on the development of economic thinking and analytical skills of students.*

The article highlights the importance of the Russian language in a multilingual educational environment, where it acts as a means of interethnic and professional interaction. Its role in the standardization and systematization of economic terminology is noted, which contributes to the accuracy of professional communication and reduces the risks of distortion of economic meaning. The article examines the impact of Russian language proficiency on the professional training of future economists, their competitiveness in the labor market and their ability to communicate effectively in the field of economics and finance.

Keywords: *Russian language, economic education, economic disciplines, professional terminology, language of science, professional communication.*

Введение

Современное экономическое образование требует от обучающихся не только знаний в области теории и практики экономики, но и высокого уровня языковой подготовки. Язык выступает важнейшим инструментом передачи, осмысления и интерпретации экономической информации. В условиях глобализации и активного развития международных экономических связей возрастает роль языков, способных обеспечивать эффективное профессиональное и научное взаимодействие [1].

Русский язык на протяжении длительного времени занимает важное место в системе высшего образования и научных исследований в странах постсоветского пространства. Он используется как язык преподавания, научных публикаций и профессионального общения, в том числе в экономической сфере. В Республике Узбекистан русский язык сохраняет значительную роль как средство межнационального общения и доступа к научным знаниям, что подчёркивалось в трудах И.А. Каримова [2].

Русский язык как средство освоения экономических знаний

Экономические дисциплины характеризуются высокой степенью абстрактности и насыщенностью теоретическими понятиями. Усвоение таких категорий, как экономический рост, инфляция, рынок, конкуренция и финансовая устойчивость, требует точности формулировок и глубокого

понимания терминов [3]. Русский язык, обладая развитой научной лексикой, позволяет чётко и последовательно излагать экономические концепции.

Использование русского языка в образовательном процессе способствует формированию системного экономического мышления. Студенты получают возможность анализировать экономические явления, сопоставлять различные теоретические подходы и делать обоснованные выводы, опираясь на научную литературу и учебные материалы [4].

Русский язык в изучении основных экономических дисциплин

Изучение экономических дисциплин в системе высшего образования предполагает освоение сложных теоретических конструкций, моделей и закономерностей, которые требуют точного понятийного аппарата. Русский язык в данном контексте выступает важным инструментом передачи экономических знаний, так как большая часть учебно-методических материалов, научных статей и аналитических обзоров по экономике представлена именно на русском языке [5].

Такие дисциплины, как макроэкономика и микроэкономика, опираются на абстрактные понятия и логические связи между экономическими явлениями. Понимание этих связей невозможно без точного восприятия терминов, определений и теоретических положений, изложенных в научных текстах. Владение русским языком позволяет студентам глубже осмысливать экономические категории, анализировать причины и последствия экономических процессов, а также применять полученные знания на практике [6].

Кроме того, в процессе изучения финансовых дисциплин особое значение приобретает умение работать с нормативными документами, отчётами и статистическими материалами, которые часто представлены на русском языке. Это способствует формированию у студентов навыков профессионального анализа и интерпретации экономической информации.

Формирование профессиональной экономической терминологии

Профессиональная экономическая терминология является основой подготовки квалифицированных специалистов. Она обеспечивает точность, однозначность и логическую последовательность профессионального общения в экономической сфере [7]. Владение терминологией отражает уровень профессиональной культуры и экономического мышления специалиста.

Русский язык способствует усвоению экономической терминологии за счёт чёткой структурированности понятий и устойчивых терминологических конструкций. Использование общепринятых русскоязычных терминов обеспечивает единообразие профессионального общения в учебной и практической деятельности. Это особенно важно при анализе экономических показателей, подготовке отчётов и обсуждении экономических стратегий [8].

Систематическое использование профессиональной терминологии на русском языке формирует у студентов навыки точного и логически

выверенного изложения экономической информации, что является важным элементом профессиональной компетентности экономиста.

Русский язык как средство развития экономического мышления

Экономическое мышление представляет собой способность анализировать хозяйственные процессы, выявлять закономерности и оценивать экономические решения с точки зрения их эффективности. Формирование данного типа мышления напрямую связано с языковой подготовкой обучающихся, поскольку именно через язык осуществляется осмысление и структурирование экономической информации [9].

Использование русского языка позволяет точно формулировать причинно-следственные связи, аргументировать выводы и корректно интерпретировать экономические данные. Работа с русскоязычными научными текстами способствует развитию аналитических и критических способностей студентов, формируя умение сопоставлять различные экономические подходы и оценивать последствия принимаемых решений.

Таким образом, русский язык выступает не только средством передачи знаний, но и инструментом интеллектуального развития будущих экономистов.

Русский язык в профессиональной коммуникации экономистов

Профессиональная деятельность экономиста связана с подготовкой аналитических отчётов, финансовых обзоров, бизнес-планов, прогнозов и деловой корреспонденции. Для выполнения этих задач необходимо владение нормами официально-делового стиля и специализированной лексикой. Русский язык широко используется в профессиональной коммуникации и играет важную роль в данной сфере [10].

Грамотное владение русским языком позволяет специалистам точно формулировать экономические положения, корректно оформлять документацию и эффективно взаимодействовать с коллегами, партнёрами и государственными структурами [11].

Русский язык в условиях многоязычной образовательной среды

Современное образовательное пространство характеризуется многоязычием и культурным разнообразием. В таких условиях русский язык часто выполняет функцию языка-посредника, обеспечивая эффективное взаимодействие между представителями различных национальностей и культур [12]. Это особенно актуально для экономического образования, где важны точность формулировок и единообразие терминологии.

Использование русского языка в многоязычной среде способствует формированию единого понятийного пространства, что облегчает процесс обучения и профессионального общения. Студенты получают возможность обмениваться знаниями, участвовать в совместных проектах и обсуждать экономические проблемы на общем языковом основании.

Владение русским языком расширяет академическую мобильность студентов и повышает их способность адаптироваться к различным образовательным и профессиональным условиям. Это делает русский язык

важным фактором интеграции в региональное и международное образовательное пространство.

Доступ к экономическим источникам и научно-исследовательской деятельности

Значительная часть научных исследований, учебников и аналитических материалов по экономике представлена на русском языке. Эти источники охватывают широкий спектр тем — от теоретических основ экономики до прикладных аспектов финансов, управления и международных экономических отношений [13].

Владение русским языком позволяет студентам и специалистам использовать данные источники для углубления знаний, проведения самостоятельных исследований и подготовки научных работ. Работа с русскоязычными материалами формирует навыки анализа, систематизации и обобщения экономической информации.

Так же, использование русскоязычных источников способствует развитию исследовательской культуры и повышению качества научных работ. Таким образом, русский язык является важным условием полноценного участия в научно-исследовательской деятельности в сфере экономики [14].

Русский язык и профессиональная конкурентоспособность экономистов

В условиях современного рынка труда особое значение приобретает конкурентоспособность специалистов. Владение русским языком значительно расширяет профессиональные возможности экономистов, позволяя им работать с широким кругом источников информации и участвовать в межрегиональных и международных проектах [15].

Знание русского языка повышает уровень профессиональной мобильности, облегчает адаптацию к требованиям работодателей и способствует карьерному росту. Экономисты, владеющие русским языком, обладают более высоким уровнем профессиональной гибкости и способны эффективно функционировать в различных экономических структурах.

Таким образом, русский язык является важным фактором профессионального успеха и устойчивого развития специалистов в области экономики.

Заключение

Русский язык играет важную роль в системе экономического образования и профессиональной подготовки экономистов. Он способствует глубокому освоению экономических дисциплин, формированию профессиональной терминологии и развитию экономического мышления. Владение русским языком обеспечивает доступ к обширному массиву научных и учебных источников, повышает качество профессиональной коммуникации и конкурентоспособность выпускников.

В условиях многоязычного образовательного пространства русский язык сохраняет свою актуальность как язык науки, образования и профессионального общения, оставаясь значимым фактором успешного

профессионального становления будущих специалистов в области экономики.

Использованные источники:

1. Экономическая теория: учебник. — М.: Экономика, 2015.
2. Каримов И.А. Экономические реформы и развитие Узбекистана. — Ташкент, 2015.
3. Основы макроэкономики: учебное пособие. — М.: Инфра-М, 2018.
4. Микроэкономика: теория и практика. — М.: Юрайт, 2017.
5. Финансы и кредит: учебник. — М.: Юрайт, 2019.
6. Экономический анализ: учебное пособие. — М.: Экономика, 2016.
7. Современный экономический словарь. — М.: Инфра-М, 2016.
8. Банковское дело: учебник. — М.: Юнити, 2018.
9. Деловой русский язык для экономистов. — М.: Высшая школа, 2017.
10. Экономика и межкультурная коммуникация. — Ташкент, 2019.
11. Международная экономика: учебник. — М.: Инфра-М, 2018.
12. Экономическое образование в условиях глобализации. — Ташкент, 2020.
13. Финансовый менеджмент: учебное пособие. — М.: Юрайт, 2019.
14. Экономика Узбекистана: учебник. — Ташкент, 2018.
15. Макроэкономическое развитие: теория и практика. — Ташкент, 2020.

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ФИКТИВНЫЙ ПУНКТ В ТРАНСПОРТНОЙ ЗАДАЧЕ: МАТЕМАТИЧЕСКИЙ ПРИЁМ И ЕГО ЭКОНОМИЧЕСКАЯ ИНТЕРПРЕТАЦИЯ

***Аннотация:** В статье рассматривается каноническая транспортная задача, являющаяся одной из самых важных задач оптимизационного типа как в экономике, так и в логистике. Однако при решении данного типа задач может возникнуть дисбаланс, когда общая сумма поставщиков не равна общей сумме потребителей, что требует введения фиктивных пунктов спроса или предложения для получения корректного оптимального решения. Основной акцент статьи сделан на раскрытии экономического смысла рассматриваемой ситуации, как в рамках общей экономической теории, так и в контексте практических задач логистики.*

***Ключевые слова:** транспортная задача, фиктивный пункт, оптимизация, логистика, экономическая интерпретация.*

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FICTITIOUS NODE IN THE TRANSPORTATION PROBLEM: A MATHEMATICAL TECHNIQUE AND ITS ECONOMIC INTERPRETATION

***Abstract:** The article examines the canonical transportation problem, which is one of the most important optimization problems in both economics and logistics.*

However, when solving this type of problem, an imbalance may arise when the total supply does not equal the total demand. In such cases, it becomes necessary to introduce fictitious demand or supply nodes in order to obtain a correct optimal solution. The main focus of the article is on revealing the economic meaning of the

situation under consideration, both within the framework of general economic theory and in the context of practical logistics problems.

Keywords: *transportation problem, fictitious node, optimization, logistics, economic interpretation.*

Введение. Транспортная задача является типичным примером задачи линейного программирования, в которой необходимо составить план перевозки однородного груза так, чтобы общие затраты на транспортировку были минимальными, а, следовательно, наиболее экономически выгодными.

Исходная информация:

a_i – условное число единиц груза в i -м пункте отправления ($i = 1, \dots, m$);

b_j – спрос в j -м пункте назначения ($j = 1, \dots, n$) в условных единицах груза;

c_{ij} – конечная стоимость транспортировки условной единицы груза из i -го пункта в j -й пункт назначения.

При выше принятых обозначениях:

$$\sum_{i=1}^m \sum_{j=1}^n c_{ij} x_{ij}$$

– суммарная издержка на транспортировку;

$$\sum_{j=1}^n x_{ij}$$

– общее количество груза, вывозимого из i -го пункта;

$$\sum_{i=1}^m x_{ij}$$

– общее количество груза, доставляемого в j -й пункт.

Экономический смысл фиктивного пункта. На практике нередко возникают излишки продукции на складах, недобор спроса в отдельных регионах или, наоборот, дефицит, что приводит к необходимости учитывать либо не востребованные запасы, либо неудовлетворенный спрос при планировании перевозок.

В частности, фиктивный пункт назначения в транспортной модели может вводиться при наличии излишков продукции, причиной которых является отсутствие потребителя в рассматриваемый временной период. Это может быть связано с ошибками прогнозирования спроса, сезонными колебаниями, нарушением контрактных обязательств, а также ограничениями транспортной инфраструктуры.

Фиктивный пункт отправления, в свою очередь, может интерпретироваться как дефицит ресурсов в ситуации, когда фактический объем поставок оказывается недостаточным для покрытия спроса. В экономическом смысле это характеризует неудовлетворенный спрос и

указывает на необходимость привлечения внешних поставщиков, срочного увеличения объемов производства или пересмотра логистической стратегии.

Возникновение нулевого тарифа при фиктивном пункте. Обычно конечная стоимость транспортировки (далее - тариф) к фиктивному пункту или из него принимается равной нулю. Это объясняется тем, что фиктивный пункт не соответствует реальному объекту транспортной сети и не отражает фактические транспортные издержки. Роль такого тарифа заключается исключительно в обеспечении баланса транспортной модели и выявлении объемов излишков и дефицита.

Тем не менее, в прикладных задачах допускается задание положительного тарифа для фиктивных перевозок. Это позволяет учитывать штрафы за хранение излишков, упущенную выгоду или другие потери, связанные с неудовлетворенным спросом.

Пример практического применения. Для иллюстрации рассмотренных положений далее приведён пример транспортной задачи с введением фиктивного пункта, демонстрирующий влияние данного приема на структуру допустимого плана перевозок и интерпретацию полученных результатов.

Задача №1. Планирование перевозок с излишками продукции.

Рассматривается ситуация, когда предприятие осуществляет поставки продукции из нескольких пунктов отправления в несколько пунктов назначения. В процессе планирования возникает несоответствие между суммарным запасом и суммарным спросом: общий объем производства превышает потребности потребителей, и часть продукции остается невостребованной.

Наглядно:

		b_1	b_2	b_3
		100	100	300
a_1	200	2	6	5
a_2	300	4	3	1
a_3	700	1	4	3

Здесь:

Пункты отправления (a_1, a_2, a_3) - это производители, которые формируют предложение продукции. Каждому производителю соответствует запас, доступный для распределения.

Пункты назначения (b_1, b_2, b_3) - это потребители, характеризующиеся определённым объёмом спроса.

Каждое число в пересечении строки (производитель a_1 - a_3) и столбца (потребитель b_1 - b_4) представляет собой тариф перевозки одной единицы продукции от производителя к потребителю.

Замечаем, что сумма товаров производителей превышает суммарный спрос потребителей:

$$(200 + 300 + 700) > (100 + 100 + 300)$$

Это означает, что часть продукции остается невостребованной, то есть возникает избыток. Для корректного учета такой излишней продукции вводится фиктивный пункт b_4 , который восполняет разницу между суммарным запасом и суммарным спросом:

$$(200 + 300 + 700) = (100 + 100 + 300) + 700$$

Получаем замкнутую матрицу:

Стоит обратить внимание, что тарифы у введенного фиктивного пункта b_4 нулевые, поскольку фактических перевозок к этому пункту не осуществляется. Он используется исключительно для учета излишков продукции, возникающих при превышении суммарного запаса над суммарным спросом, что позволяет корректно сбалансировать модель и оценить возможный экономический убыток. На этом основании можно

определить допустимый план распределения продукции, включая объем, направляемый в фиктивный пункт.

Поскольку основное внимание уделяется показу применения фиктивного пункта для балансировки транспортной задачи, а не достижению оптимального решения, для определения допустимого плана перевозок применяется метод северо-западного угла, позволяющий получить начальное базисное допустимое решение задачи, наименее простым и быстрым путем:

		b_1	b_2	b_3	b_4
		100	100	300	700
a_1	200	100 ²			100 ⁰
a_2	300		100 ³	200 ¹	
a_3	700			100 ³	600 ⁰

Суммарные транспортные затраты определяются как сумма произведений объемов перевозок на соответствующие тарифы. Для реальных пунктов назначения получаем:

$$(100 \cdot 2) + (100 \cdot 3) + (200 \cdot 1) + (100 \cdot 3) = 1000$$

Что означает, что 1000 денежных единиц составляют затраты на перевозку продукции, фактически реализованной потребителям, при полном покрытии их спроса.

Однако, вместе с этим, как можно заметить, часть продукции направляется в наш, ранее введенный, фиктивный пункт b по нулевому тарифу. В частности, поставки из пунктов отправления a и a в фиктивный пункт составляют:

$$(100 \cdot 0) + (600 \cdot 0)$$

Данные перевозки не увеличивают суммарные транспортные затраты, поскольку сам фиктивный пункт не соответствует реальному потребителю. Но вот в экономическом смысле указанные объемы четко отражают излишки продукции, не реализованные в рассматриваемом периоде времени.

Таким образом, объем избыточной продукции составляет 700 единиц, что соответствует объему поставок, направленных в фиктивный пункт.

Приведенный показатель выражается в натуральных единицах, поскольку характеризует количество продукции, не нашедшей спроса, а не финансовые затраты.

Отсюда следует, что введение фиктивного пункта позволило привести задачу к замкнутому типу, корректно учесть излишки продукции и получить наглядную интерпретацию результатов транспортной модели.

Задача №2. Планирование перевозок при дефиците продукции (неудовлетворенный спрос).

Рассматривается ситуация, аналогичная задаче №1, где несколько пунктов отправления и несколько пунктов получения, но в данном случае возникает обратное несоответствие между суммарным запасом и суммарным спросом, когда общий объем производства (a , a , a) оказывается недостаточным для полного удовлетворения потребностей потребителей, поэтому для корректного учета неудовлетворенного спроса и приведения задачи к замкнутому типу в модель вводится фиктивный пункт отправления (a), который в свою очередь отражает дефицит объема продукции.

Рассмотрим построение опорного плана в табличной форме:

Исходная таблица

		b_1	b_2	b_3
		450	350	850
a_1	200	5	3	2
a_2	150	1	9	8
a_3	750	7	6	3

Можно заметить, что суммарный объем имеющихся товаров не равен суммарной величине потребностей.

$$(200 + 150 + 750) \neq (450 + 350 + 850)$$

В связи с этим в модель вводится фиктивный пункт назначения:

		b_1	b_2	b_3
		450	350	850
a_1	200	5	3	2
a_2	150	1	9	8
a_3	750	7	6	3
a_4	550	0	0	0

$$(200 + 150 + 750) + 550 = (450 + 350 + 850)$$

Как показано выше, задача приведена к замкнутому виду и можно приступать к построению допустимого опорного плана перевозок.

Воспользуемся методом минимизации:

		b_1	b_2	b_3
		450	350	850
a_1	200			200 ²
a_2	150	150 ¹		
a_3	750		100 ⁶	650 ³
a_4	550	300 ⁰	250 ⁰	

Находим суммарные транспортные затраты:

$$(150 \cdot 1) + (100 \cdot 6) + (200 \cdot 2) + (650 \cdot 3) = 3100$$

Суммарные транспортные затраты, рассчитанные на основе полученного опорного плана перевозок, составляют 3100 денежных единиц. Данная величина характеризует затраты на транспортировку продукции к реальным пунктам назначения, однако спрос потребителей b и b в полном объеме не удовлетворен, что свидетельствует о наличии дефицита продукции. Так, объем перевозок из фиктивного пункта a отражает величину дефицита продукции, которая равна:

$$(300 \cdot 0) + (250 \cdot 0)$$

Из примера выше получаем, что величина дефицита продукции составляет 550 единиц, что соответствует нашему объему перевозок, которые

были осуществлены из фиктивного пункта (a_4) отправления. Данная величина показывает количество продукции, спрос на которую не был покрыт.

Отсюда вытекает, что введение нами фиктивного пункта отправления дало возможность привести транспортную задачу к замкнутому типу, и конечно же корректно учесть неудовлетворенный спрос.

Заключение. В статье была рассмотрена транспортная задача из линейного программирования и роль фиктивного пункта, используемого для балансировки системы предложения и спроса. Показано, что введение фиктивного пункта позволяет привести открытую модель к замкнутой, обеспечивая корректность и оптимальность решения. С экономической точки зрения, фиктивный пункт отражает излишки и дефицит ресурсов, что позволяет учитывать потенциальные потери, связанные с избытком запасов или неудовлетворенным спросом. Рассмотренные подходы имеют как математическое, так и экономико-логистическое значение и могут применяться для планирования перевозок и управления запасами. Таким образом, фиктивный пункт является полезным инструментом как в математическом, так и в экономическом контексте транспортной задачи.

Использованные источники:

1. Карманов В.Г. Математическое программирование: учеб. пособие. - 5-е изд., стер. - М.: ФИЗМАТЛИТ, 2004. - 264 с. - С. 12-13.
2. Лекции по высшей математике Ташкентского государственного экономического университета: учебно-методические материалы. - Ташкент.
3. Зеваков А.М. Логистика материальных запасов и финансовых активов. - СПб.: Питер, 2005. - 185 с.

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СПЕЦИФИКА РЕАБИЛИТАЦИИ ДЕТЕЙ С ОГРАНИЧЕННЫМИ ВОЗМОЖНОСТЯМИ

Аннотация: Детские инвалидности, особенно врожденные, являются большим несчастьем для каждой семьи. В этом случае для достижения ребенком в будущем уровня самостоятельности необходима помощь квалифицированных специалистов. Комплексный подход может показать эффективные результаты и помочь частично или полностью выйти из этой сложной ситуации.

Ключевые слова: квалифицированная помощь. процесс реабилитации. главная цель. различные специалисты. сложная ситуация.

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THE SPECIFICS OF REHABILITATION FOR CHILDREN WITH DISABILITIES

Annotation: Childhood disabilities, especially congenital ones, are a great tragedy for every family. In this case, the help of qualified specialists is essential for the child to achieve future independence. A comprehensive approach can yield effective results and help partially or completely overcome this difficult situation.

Keywords: qualified assistance, rehabilitation process, primary goal, various specialists, complex situation.

Жизни деятельности больных с ДЦП состоит во взаимосочетании различных аспектов реабилитации: реабилитационного, физического и психологического, социального, эмоционального и образовательного.[6] В последнее время повышенное внимание уделяется новым организационным формам в комплексной системе реабилитации. Среди них значительный интерес представляет игровой метод научить ребенка к бытовым навыкам.

Цель исследования - разработать и научно обосновать новую организационную форму и систему занятий подвижными играми в комплексе с другими нетрадиционными средствами в целях обучить к бытовым навыкам детей с последствиями ДЦП.

Методы исследования - дети в возрасте от 8 до 14 лет с последствиями ДЦП. Прежде чем приступать к реабилитационным мероприятиям необходимо определять исходную степень выраженности двигательных расстройств с целью правильного планирования и рационального построения занятий. Реабилитационные занятия должны соответствовать возможностям ребёнка, поддерживать мотивацию детей с последствиями ДЦП к продолжению занятий, создавать благоприятный эмоциональный фон. Программа реабилитационно - восстановительных воздействий учить ребенка к бытовым навыкам средствами физической культуры и спорта для детей с последствиями ДЦП помогает решить следующие задачи:

- совершенствование навыка ходьбы;
- улучшение равновесия и координации движений;
- развитие мелкой моторики кистей рук;
- развитие эмоционально-волевой сферы;
- развитие пространственных двигательных ориентировок
- отработка качественной стороны и закрепление ранее приобретённых двигательных умений и навыков.

На ранних этапах реабилитационно - восстановительных мероприятий, наиболее эффективным мы считаем индивидуальный метод работы с ребёнком, в дальнейшем тренировочные занятия с детьми должны проводиться различными методами: индивидуальным, мало - групповым и групповым. В комплексную систему реабилитационно - восстановительных мероприятий учить ребенка к бытовым навыкам наряду с общепринятыми средствами и формами физической культуры и спорта желательно включать нетрадиционные методы воздействия, например:

- компьютерные развивающие игры;
- психо гимнастику.

Для решения коррекционных задач широко использовался игровой метод проведения занятий, состоящий из различных игровых ситуаций, заданий, упражнений и игр. При проведении спортивных игр дети со спастической диплегией нуждаются в специальных упражнениях, способствующих укреплению мышц спины, расслаблению приводящих мышц бёдер и преодолению позотонических рефлексов. Отличительной особенностью разработанной методики реабилитационно-рекреативных мероприятий является дифференцирование всех используемых средств и форм реабилитации, подвижных и спортивных игр по формам заболевания и степени двигательных нарушений. Реализация и эффективность реабилитационно оздоровительных мероприятий для детей с последствиями ДЦП, может осуществляться только при систематическом врачебном контроле. Проведенный нами педагогический эксперимент и полученные

результаты позволили научно обосновать эффективность комплексной методики реабилитационно-рекреативных воздействий.

Выводы. Практика использования существующих методов и средств реабилитации при ДЦП по литературным данным показала недостаточную эффективность, что предопределяет поиск новых подходов, средств, методов и форм для успешного проведения реабилитационно-рекреативных мероприятий. Характер реабилитационных воздействий на организм ребёнка с последствиями ДЦП должно быть комплексным, реабилитационно-рекреативные занятия должны учитывать механизмы поддерживать мотивацию детей-инвалидов к постоянным занятиям, проводить занятия в режиме, соответствующем возможностям ребёнка, создавать благоприятный психологический фон. Комплексная система реабилитационных воздействий, используемая нами в работе состояла из:

- специальных физических упражнений направленного воздействия;
- физических упражнений с элементами гимнастики;
- игровых занятий направленного воздействия;
- спортивных и подвижных игр;
- компьютерных развивающих игр;
- курса психогимнастики.

Основополагающим направлением нашей работы является игровой метод. Наряду с традиционными игровыми методами, мы применяли также целую группу относительно новых перспективных методов работы с данным контингентом детей: метод музыкально-ритмической терапии; метод аналогий с животными и растительным миром; метод «театра физического воспитания».

Результаты, физической реабилитации детей-инвалидов показали высокую эффективность, что выразилось в улучшении их двигательных возможностей.

Результаты рекреативно-реабилитационных мероприятий оказали благотворное влияние, и на психическое состояние детей-инвалидов с ДЦП. Об этом иллюстрируют следующие данные:

- при проведении теста по шкале личностного дифференциала по фактору силы личности в экспериментальной группе различия оказались достоверными и составили 28%. В контрольной группе выявленные различия оказались не достоверными при улучшении показателя фактора силы личности на 9%.

Таким образом, комплексная система рекреативно-реабилитационных воздействий показала свою эффективность учить к бытовым навыкам детей с ДЦП и может быть рекомендована для использования в практической работе с инвалидами с последствиями ДЦП.

Использованные источники:

1. Худойкулова Ф. В. и др. the structure, age features, and functions of hormones. pedagog, 1 (5), 681-688. – 2023.

2. Tursunovna E. M. et al. BENEFITS OF USING ALL ASPECTS OF REHABILITATION FOR CHILDREN WITH CEREBRAL PALSY //International journal of medical sciences. – 2024. – Т. 4. – №. 05. – С. 61-66.
3. Tursunovna E. M. et al. MIYA FALAJLI BOLALARDA UZLUKSIZ REABILITATSIYANI TASHKIL ETISH USULLARI //JOURNAL OF BIOMEDICINE AND PRACTICE. – 2024. – Т. 9. – №. 1.
4. Malika E., Rasulov J. MODERN METHODS OF TREATING CEREBRAL PALSY //CONFERENCE ON THE ROLE AND IMPORTANCE OF SCIENCE IN THE MODERN WORLD. – 2024. – Т. 1. – №. 3. – С. 79-87.
5. Усманходжаева А. А., Матмуродов Р. Ж., Эгамова М. Т. Развитие физиологические движения у детей с детским церебральным параличом //ЖУРНАЛ НЕВРОЛОГИИ И НЕЙРОХИРУРГИЧЕСКИХ ИССЛЕДОВАНИЙ. – 2020. – Т. 1. – №. 1.,,,
6. Tursunovna E. M. et al. BOLALAR BOSH MIYA FALAJI BOR BEMORLARDA ONALAR ISHTIROKIDAGI REABILITASIYA SAMARADOROIGI //JOURNAL OF BIOMEDICINE AND PRACTICE. – 2024. – Т. 9. – №. 1.
7. Vafokulovna K. F. NO ALCOHOL OF THE LIVER DIAGNOSTIC AND TREATMENT OF OBESITY DISEASE MODERN OBJECTIVES. Conference Zone, 600–605. – 2022.
8. Антропова, М. В. (2018). *Реабилитация детей с ограниченными возможностями здоровья*. Москва: Академия. pp. 45–62.
9. Бгажнокова, И. М. (2019). *Коррекционная педагогика: теория и практика*. Москва: Владос. pp. 88–104.
10. Выготский, Л. С. (2003). *Основы дефектологии*. Санкт-Петербург: Лань. pp. 112–136.
11. Дубровина, И. В. (2020). Психолого-педагогическое сопровождение детей с инвалидностью. *Вопросы психологии*, 4, 57–66. <https://doi.org/10.11621/voppsy.2020.04.06>
12. Кислякова, Н. Ф. (2017). *Социальная реабилитация детей-инвалидов в условиях образовательных учреждений*. Москва: Просвещение. pp. 73–91.

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ПОЛОЖИТЕЛЬНОЕ ВЛИЯНИЕ ФИЗИЧЕСКИХ НАГРУЗОК НА ОРГАНИЗМ РЕБЕНКА С ИНВАЛИДНОСТЬЮ

***Примечание:** Физические нагрузки оказывают положительное воздействие на любой организм при умеренном применении. Поэтому при постоянном применении физических нагрузок больному ребенку с инвалидностью они оказывают положительное влияние на обмен веществ в организме, кровообращение, состояние мышц и костей. Стимулируется как физическое, так и психическое состояние ребенка. В этом случае участие матери в процессе реабилитации также окажет положительное влияние на ребенка.*

***Ключевые слова:** участие матери, процесс реабилитации, природные факторы, положительный эффект, основная цель.*

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THE POSITIVE IMPACT OF PHYSICAL ACTIVITY ON A CHILD WITH DISABILITIES

***Note:** Physical activity has a positive effect on any body when used in moderation. Therefore, regular physical activity in a child with disabilities has a positive effect on metabolism, circulation, and muscle and bone health. Both the child's physical and mental well-being are stimulated. In this case, the mother's participation in the rehabilitation process will also have a positive impact on the child.*

***Keywords:** maternal participation, rehabilitation process, natural factors, positive effect, primary goal.*

Актуальность. Борьба с инвалидностями является проблемой общегосударственного значения. Внутривнутриутробная и родовая поражения мозга

является одним из тяжелых форм инвалидности. Детский церебральный паралич является инвалидом этой категории. В рамках социальной модели особое внимание уделяется интеграции инвалидов в социальную среду и обеспечению условий для их самостоятельной жизни.[3] При детском церебральном параличе кроме двигательного расстройства, нарушается психика и речь. В целом, ведущим клиническим симптомом при ДЦП является спастичность, встречающаяся более чем в 80% случаев.[1]

Лечение детей церебральными параличами должно проводиться не только специализированных учреждениях, но и в домашних условиях.

Цель исследования: цель нашей работы при детском церебральном параличе научит родителей как заниматься домашних условиях длительное время и непрерывно. **Материал и методы исследования:** В нашем исследовании приняли участие 42 детей с 2 до 9 лет. Мы их разделили на 2 группы. Обе группы получили в клинике стандартное лечение. В контрольную группу мы брали 22 детей, которые мы продолжали лечебную гимнастику в домашних условиях. Мы провели по следующей методике лечебная физкультура при детском церебральном параличе: регулярность, систематичность и непрерывность занятий. Каждому пациенту сделано индивидуальный подход, при этом учитывалось стадии и тяжести заболевания, а также возраста и психического развития пациента. Мы научили родителей логопедический массаж, который состоит из массажа лицевых и артикуляционных мышц. Этими массажами нормализуется тонус мышц.

Выбирались специальные легкие упражнения, чтобы не затруднить родителей и ребенка. Объяснили родителям, что важен не трудность упражнения, а постепенность и регулярность. Для нормализации работы вестибулярного аппарата применялись следующие движения: лежа на спине и на животе-поднимать головы наклонять туловище. Также включили упражнения-ходьба, поднимать руки вверх, вперед, закрывать глаза. Тем пациентам, у которого повышенный тонус использовался точечный массаж, сегментарный массаж. Те у кого есть возможность включали гидрокинезиотерапию, которая состоит из плавания, гимнастика и игр на воде. Пациентам, у которого низкий тонус удавалось упражнения с поддержанием равновесия. При спастической диплегии применялись упражнения с непрерывным движением, при астатической форме упражнения применялись кратковременными с передышками между ними.[2] При атонической форме особое внимание уделяли упражнениям с поддержанием равновесия. Чтобы получить больше эффект сочетали лечебную физкультуру с массажем. Научили родителей сделать классический массаж. Массаж проводился курсами, по 10 дней и 1-2 дня перерыв. Использовали различные приемы массажа: поглаживание, разминание, поколачивание, особенно при атонии и гипотонии мышц. Так как противопоказание к нему нет, можно его применять ежедневно, длительно

Для того чтобы получить максимальный эффект строго наблюдалось постоянство мероприятия. Только тогда можно рассчитывать на результаты.

Результаты: После стандартной лечения те дети которые занимались в домашних условиях могли развивать мышечную силу. У ребенка появилась доверие в себя, что он сможет сделать кое какие дела. Длительной лечебная физкультурой ребенок начал ходить уверенно. Мышцы начали реагировать двигательным сигналам. Детям заниматься с родителями дало уверенность и они с удовольствием выполняли упражнение. Благодаря этому у детей наблюдалось большой положительный эффект После курсового лечения частично восстановилась нервная система, так как нервная система у ребенка еще достаточно гибкая и способна меняться. Плавание детям воспроизводил положительные эмоции, который можно осуществлять не только в бассейне но и обычной ванне. Занятие вместе с родителями позволило как минимум в два раза улучшить состояние ребенка. Чем меньше возраст ребенка, тем реабилитация было эффективные, но, тем не менее, приступить к ним никогда не поздно. Дети с гипотонусами могли научиться обслуживать себя. После нашего курса и у них появилась положительные изменения. Используя комплекс упражнений вместе с родителями, могли улучшить состояние двигательной сферы ребенка с дефектом нервной ситемы. При первом группе все эти перечисленные результаты не выявлены. С медицинской точки зрения нет способа лечения, дающего возможность восстановить поврежденный мозг. Но если работать длительно, непрерывно, регулярно нервная система постепенно начинает выполнять свои функции. Программа который включает в лечебный процесс родителей по физическому воспитанию играют ведущую роль в комплексной реабилитации детей с детским церебральным параличом.

Выводы: И так, детский церебральный паралич- это неизлечимое заболевание, но лечебной физкультурой в домашних условиях вместе с родителями можно облегчит его последствия и синдромы. При этом применять, лекарственные препараты еще улучшит состояние ребенка. Все эти упражнения с родителем играет огромную роль в адаптации больного к внешним условиям. Предлагаемая нами лечебная физкультура в домашних условиях наиболее эффективные легко выполняемые и дали положительные результаты сравневая с предыдущей группой. Факторами, влияющими на эффективность лечения у больных ДЦП, являются: ранняя диагностика, комплексность и адекватность методов коррекции, непрерывная и длительная работа с ребенком и семьей [2]. Те дети которые занимались в домашних условиях хот мало но научились самообслуживание. Значит не только в больничных условиях и санаториях, но и в домашних условиях если родители занимаются с детьми детским церебральны парличом , тогда результаты будут намного больше.

Использованные источники:

1. ХУДОЙКУЛОВА Ф. В., МАВЛЯНОВА З. Ф. JIGARNING NOALKOGOL YOG'HASTALLIGIGA ZAMONAVIY QARASHLAR //ЖУРНАЛ БИОМЕДИЦИНЫ И ПРАКТИКИ. – 2022. – Т. 7. – №. 4.

2. Худойкулова Ф. В. и др. the structure, age features, and functions of hormones. *pedagog*, 1 (5), 681-688. – 2023.
3. Эгамова М. Т. РОЛЬ ФИЗИЧЕСКОЙ КУЛЬТУРЫ ДЛЯ ДЕТЕЙ С ЦЕРЕБРАЛЬНЫМ ПАРАЛИЧОМ В ДОМАШНИХ УСЛОВИЯХ //Современные вопросы психологии и образования в контексте работы с различными категориями детей и молодежи: психолого-педагогические аспекты творческой самореализации. – 2019. – С. 82-87.
4. Эгамова М. Т. соавт. Игровой метод реабилитации детей с детским церебральным параличом //Индийский журнал судебной медицины и токсикологии. – 2020. – Т. 14. – №. 4. – С. 7979-7983.
5. Худойкулова Ф. В. и др. THE STRUCTURE, AGE FEATURES, AND FUNCTIONS OF HORMONES //PEDAGOG. – 2023. – Т. 1. – №. 5. – С. 681-688.
6. Анисимова, Е. А. (2019). *Адаптивная физическая культура в системе реабилитации детей-инвалидов*. Москва: Академия. pp. 34–56.
7. Евсеев, С. П. (2018). *Теория и методика адаптивной физической культуры*. Санкт-Петербург: Питер. pp. 71–95.
8. Лях, В. И. (2017). Физическая активность как фактор укрепления здоровья детей с ограниченными возможностями. *Физическая культура: воспитание, образование, тренировка*, 3, 22–27.
9. Мартынова, Н. А. (2020). Влияние дозированных физических нагрузок на психоэмоциональное состояние детей с инвалидностью. *Педагогика и психология здоровья*, 2, 48–55.

ОСОБЕННОСТИ СОЗДАНИЯ СПЕЦИАЛЬНЫЕ ЭКОНОМИЧЕСКОЙ ЗОНЫ В РЕГИОНЕ

Аннотация: В данной статье представлены научно обоснованные предложения и рекомендации по процессам социально-экономического развития регионов путем привлечения местных и иностранных инвестиций по основным целям и задачам создания особых экономических зон. Также освещены вопросы, направленные на совершенствование методического обеспечения реализации и обоснование целей а также основных особенностей создания особой экономической зоны в регионах.

Ключевые слова: особая экономическая зона, свободная экономическая зона, регионы, ресурсы, ВВП, эффективность, проекты, инвестиции, предпринимательство, социально-экономическое развитие.

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FEATURES OF ESTABLISHING A SPECIAL ECONOMIC ZONE IN THE REGION

Abstract: This article presents scientifically grounded proposals and recommendations on the processes of socio-economic development of regions through attracting local and foreign investments, in line with the main goals and objectives of establishing special economic zones. It also addresses issues aimed at improving the methodological framework for implementation and substantiating the goals, as well as the key features of establishing special economic zones in the regions.

Keywords: special economic zone, free economic zone, regions, resources, GDP, efficiency, projects, investments, entrepreneurship, socio-economic development.

Введение. Привлечь важные для развития региона отечественные и иностранные инвестиции путем организации специальных экономических зон (СЭЗ), реализовать использование современных передовых технологий и продуманной системы управления в производстве, создать новые рабочие места в регионе. регионов, повышение экспортного потенциала страны, деятельность специальных экономических зон. Такие вопросы, как совершенствование методологии оценки эффективности, выявление факторов, влияющих на эту сферу и оценка показателей эффективности,

входят в число приоритетных направлений научных исследований в этой связи.

На современном этапе социально-экономического развития Республики Узбекистан уделяется внимание созданию и развитию специальных экономических зон как одному из важных направлений эффективного использования экономического потенциала. Если первая свободная экономическая зона «Навои» была создана в стране в 2008 году, то сегодня действуют 24 свободные экономические зоны. Повышение эффективности создаваемых СЭЗ, разработка четких критериев отбора проектов для размещения проектов на территориях свободных экономических зон, количества создаваемых рабочих мест при рассмотрении инвестиционных проектов, обеспечение достоверности потенциального иностранного партнера, исследование таких факторов, как внутренний и внешний спрос на продукцию, объемы экспорта, устранение бюрократических препятствий в механизме утверждения инвестиционных проектов, создание необходимой инженерно-коммуникационной инфраструктуры для функционирования свободных экономических зон в своевременное, местное и региональное планирование предлагаемых инвестиционных проектов, предоставление иностранных кредитных ресурсов, активизация деятельности прикрепленных к ним коммерческих банков, повышение эффективности использования производственных мощностей предприятий, работающих в свободных экономических зонах, объемов производства и экспорта, определены задачи по обеспечению соответствия количества создаваемых рабочих мест параметрам утвержденного бизнес-плана.

Анализ литературы по теме. По результатам исследований ученых по особым экономическим зонам, доходы успешных особых экономических зон занимают 5-е место в ВВП страны, а также около 40-60% валового объема экспорта страны, от 30% до 80%. всех иностранных инвестиций поступает через специальные экономические зоны. Вопросы исследования развития особых экономических зон, оценки их эффективности, аспекты, которые следует изучить при организации экономических зон в научных исследованиях свободные экономические зоны друг от друга научно исследованы путем дифференциации.

Также в исследованиях ученых стран СНГ, в том числе Игнатова В.Г., Бутова В.И. в своих научных исследованиях обозначают вопросы выявления эффективных и неэффективных СЭЗ.

Эффективное функционирование экономических зон, анализ их деятельности, прогнозные уровни объёма производства, цели, виды, правовые основы создания свободных экономических зон от узбекских экономистов отразили в исследованиях систему оценки эффективности свободных экономических зон с точки зрения абсолютных и относительных показателей.

Методология исследования. При обосновании целей и основных особенностей создания особой экономической зоны в регионе вопросы, направленные на совершенствование методического обеспечения ее

реализации, поясняются с помощью логического мышления, сравнительного анализа, обзорно-экономического анализа и системного анализа.

Анализ и результаты. Использование термина «Особая экономическая зона», безусловно, шире, чем «Свободная экономическая зона», и включает в себя не только известную нам «зону», но и зоны высоких технологий, научные зоны, особые экономические зоны, туристско-рекреационные зоны, зеленые зоны, включая безопасные зоны.

На наш взгляд, специальные экономические зоны выполняют экономические, инновационные, ресурсные, организационные и социальные функции в рамках обеспечения экономической стабильности и социального благополучия государства.

Функции специальной экономической зоны имеют характеристики постоянства, производства товаров и услуг для потребителей, формирования новых идей, новых инструментов, факторов и технологий, рациональной и эффективной интеграции ресурсов и факторов производства, реализации тактических и стратегических цели. Создание специальных экономических зон служит увеличению числа предпринимателей в обществе, созданию рабочих мест, повышению уровня жизни и социального статуса работников.

Создание специальных экономических зон будет осуществляться в рамках действующей в стране социально-экономической системы.

Можно сказать, что создание особых экономических зон призвано поддержать людей, способных к предпринимательской деятельности, создать новые рабочие места, увеличить доходы работников, повысить их квалификацию, получить культурный отдых и улучшить здоровье, оказать практическую помощь для обеспечения семейного благополучия. а также региональная социальная инфраструктура представляет собой развитие.

Создание специальных экономических зон:

- формирование энтузиазма к предпринимательству и рост предпринимательства;
- создание новых рабочих мест;
- формирование приемлемых доходов;
- организация благоприятных условий труда;
- создание социальной инфраструктуры для населения.

Организация специальных экономических зон формируется на основе социально-экономических моделей, действующих в государствах.

«Специальные экономические зоны – это ограниченные территории, города, морские и воздушные порты, в которых применяются особые льготные экономические условия для отечественных и иностранных предпринимателей, способствующие решению внешнеторговых, общеэкономических, социальных, научно-технических и научно-технологических вопросов.

Считаем целесообразным создание специальных экономических зон на основе следующих принципов, исходя из вышеизложенных особенностей создания специальных экономических зон и их реализации в контексте

различных социальных моделей:

- возраст человека должен цениться одинаково независимо от производительности труда, то есть принцип социальной помощи для всех;
- социальная помощь должна иметь принцип постоянства;
- социальная помощь должна быть адаптируемой ко всем условиям, направленной на выравнивание социального положения работников.

Поскольку СЭЗ – новое явление для экономики Узбекистана, необходимо оперативно их формировать, создать необходимую нормативно-правовую базу для функционирования СЭЗ, организовать подготовку соответствующих специалистов, широко используя мировой опыт. в этом перспективном направлении ускорения экономического развития.

СЭЗ действуют не только горизонтально (т.е. регионально), но и вертикально (т.е. отраслево). В первом случае СЭР будет иметь ограниченную территорию, но следует также отметить, что иногда СЭР может стать вся страна.

Таким образом, создавая стимулы для иностранных инвесторов, совместных предприятий, среднего и малого бизнеса, правительство порой не осознает, что создает в стране «микроСЭР». Эти страны со средним уровнем дохода занимаются узкоспециализированными вопросами, но не оказывают существенного влияния на макроэкономическую ситуацию.

Во втором случае некоторые предприятия определенной отрасли и сама отрасль (например, сельское хозяйство, золотодобыча, машиностроение) будут иметь выгоды, имеющие отношение только к их деятельности: для Узбекистана, например, это может быть туризм (табл. 1).

Таблица 1.

Виды особых экономических зон и свободных зон⁴⁷

Специальные экономические зоны	Свободный зоны
Парки высоких технологий	Экспортно-ориентированные зоны
Научные парки	Специальные торговые зоны
Научно-технологические зоны	Особая зона, где расположено одно предприятие
Специальных экономические зоны	Экспортно-ориентированное производство Торгово-ориентированные зоны специального предпринимательства иностранных государств
Парк услуг	Транспортная и многоцелевая Внутренняя, внешняя, экспортная зоны
Зеленые зоны	Многоцелевая зона внутренней поддержки развития малых регионов
Безопасные зоны	Специальные зоны продвижения внешней, внутренней и реэкспортной торговли
Зоны развития туризма и т.д.	Спецпорты Зоны комплексного развития

⁴⁷ Разработка автора

Согласно табл. 1, как специальные торговые зоны, так и специальные экспортные зоны и специальные порты типичны для опыта развитых стран и занимают важное место в развитии экспорта, реэкспорта и импорта. Согласно Закону Республики Узбекистан «О специальных экономических зонах»[1], специальные экономические зоны делятся на такие типы, как специальные экономические зоны, специальные научно-технические зоны, туристско-рекреационные зоны, специальные торговые зоны, специальные индустриальные зоны. .

Особая экономическая зона - создание новых производств, развитие высокотехнологичного производства, активное участие в развитии производства современной конкурентоспособной, импортозамещающей, экспортоориентированной готовой промышленной продукции, а также производства, инженерных коммуникаций, автомобильного транспорта, социальная инфраструктура и логистика – территория, созданная с целью обеспечения развития сферы услуг.

Специальная научно-технологическая зона – это территория, на которой с этой целью собираются научные организации и другие организации в сфере научной деятельности (технологические парки, центры распространения (трансфера технологий), инновационные кластеры, венчурные фонды, бизнес-инкубаторы и т.п.). развития инновационной инфраструктуры.

Технико-экономическая база особых экономических зон должна включать следующие 8 разделов:

- Цели создания СЭЗ;
- Условия создания СЭЗ;
- Основания выделения земли под СЭЗ и характеристика выделяемой территории;
- Перспективы и программы развития СЭЗ ;
- Ресурсы, необходимые для создания СЭЗ;
- Рабочий механизм СЭЗ;
- Организационная деятельность по организации и деятельности МИЗ;
- Оценка эффективности организации СЭЗ .

Экономические цели:

➤ иностранный и национальный капитал посредством специальных льготных экономических механизмов, стабильной правовой базы и упрощения различных организационных процессов.

➤ привлекать;

➤ использовать преимущества международного географического разделения труда и международного обращения капитала для расширения экспорта готовой продукции, организации рационального механизма импорта и импортозамещения производства;

➤ рост валютных поступлений в бюджет страны и региона;

➤ различные формы ТЭЗ; ликвидация монополий внешней торговли путем открытия дороги всем организациям и предприятиям СЭЗ .

Выводы. Во-первых, основная цель создания СЭЗ в стране – более

глубокое вовлечение страны в процесс развития международного разделения труда. Во-вторых, еще одной целью создания СЭЗ является насыщение внутреннего рынка страны качественной продукцией, способной заменить импортные товары. В-третьих, организаторы специальной экономической зоны не уделяют внимание участию на международном торговом рынке только по линии производства, но уделяют внимание и сфере туризма, сфере культуры, санаторно-курортной сфере.

В-четвертых, целью СЭЗ является обеспечение более быстрого и широкого использования отечественных и зарубежных научных технологий в производстве, их эффективное использование в будущем, отражение их результатов в развитии национальной экономики страны. В-пятых, целью СЭЗ, создаваемых в развивающихся странах, является повышение подготовки и квалификации рабочей силы страны, инженеров, экономических работников и управленческого персонала.

В-шестых, одной из важных целей СЭЗ является стимулирование развития экономики в определенной сфере или развитие конкретного сектора. В-седьмых, в некоторых странах СЭЗ рассматривают как способ модернизации и развития определенного региона. СЭЗ поможет перейти от господствующего в стране типа экономики к современной рыночной экономике.

Если сделать вывод из вышеизложенного, то важно определить цели и задачи специальных экономических зон, прежде всего, по ускоренному развитию регионов и решению экономических и социальных проблем.

Использованные источники:

1. Закон Республики Узбекистан «О специальных экономических зонах».ЗРУ-604.17.02.2020. <https://lex.uz/docs/4737511>
2. Кабанова Е.Е. Проблемы развития социальной инфраструктуры средних городов в современной России (на примере города Гус - Хрустальный). Материалы Ивановских чтений. 2015. № 5. С. 29-34.
3. Игнатов В. Г., Бутов В.И. – “Свободные экономические зоны” – Москва, 1997 г. с.22-30.
4. Sh F. S., Nomazov B. B. THE ROLE OF THE STATE IN INCREASING THE EFFICIENCY OF ENTERPRISE IN THE REGION //Экономика и социум. – 2023. – №. 12 (115)-1. – С. 241-247.
5. Nomazov B. IMPROVING THE CONCEPTUAL FRAMEWORK FOR MODERNIZING THE TAX SYSTEM (USING THE EXAMPLE OF UZBEKISTAN). – 2024.
6. Shodmonovna S. F., Khaitovna M. S. Milliy “yashil iqtisodiyot” taksonomiyasi //THE INNOVATION ECONOMY. – 2024. – Т. 2. – №. 1
7. Samiyeva G. T. (2025). Theoretical basis of the activities of pension funds in Uzbekistan. *THE INNOVATION ECONOMY*, 3(03). Retrieved from <https://ojs.qmii.uz/index.php/ej/article/view/924> (Original work published December 29, 2024)

8. Самиева Г. Т. ОПЫТ КИТАЯ И ПУТИ К СОКРАЩЕНИЮ БЕДНОСТИ // Экономика и социум. 2024. №11-2 (126). URL: <https://cyberleninka.ru/article/n/opyt-kitaya-i-puti-k-sokrascheniyu-bednosti> (дата обращения: 20.10.2025).
9. Юлдошева Ш. А. UY-JOY KOMMUNAL XO 'JALIKLARIDA SERVIS XIZMATLARINING SAMARADORLIGI // Экономика и социум. – 2023. – №. 12 (115)-1. – С. 1604-1608.
10. Kuldasheva M. SPECIFIC FEATURES OF ENTREPRENEURSHIP IN INCREASING THE INCOME OF THE POPULATION IN THE REGION //Innovation Science and Technology. – 2025. – Т. 1. – №. 12.

ЦЕЛИ СОЗДАНИЯ СПЕЦИАЛЬНЫЕ ЭКОНОМИЧЕСКОЙ ЗОНЫ В РЕГИОНЕ

Аннотация: В данной статье представлены научно обоснованные предложения и рекомендации по процессам социально-экономического развития регионов путем привлечения местных и иностранных инвестиций по основным целям и задачам создания особых экономических зон. Также освещены вопросы, направленные на совершенствование методического обеспечения реализации и обоснование целей а также основных особенностей создания особой экономической зоны в регионах.

Ключевые слова: особая экономическая зона, свободная экономическая зона, регионы, ресурсы, ВВП, эффективность, проекты, инвестиции, предпринимательство, социально-экономическое развитие.

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OBJECTIVES OF ESTABLISHING A SPECIAL ECONOMIC ZONE IN THE REGION

Abstract: This article presents scientifically grounded proposals and recommendations for the socio-economic development of regions through the attraction of domestic and foreign investment, based on the main goals and objectives of establishing special economic zones. It also addresses issues aimed at improving the methodological framework for the implementation and justification of goals, as well as the key features of creating special economic zones in regional contexts.

Keywords: special economic zone, free economic zone, regions, resources, GDP, efficiency, projects, investment, entrepreneurship, socio-economic development.

Введение. На современном этапе социально-экономического развития Республики Узбекистан уделяется внимание созданию и развитию специальных экономических зон (СЭЗ) как одного из важных направлений эффективного использования экономического потенциала. Если первая свободная экономическая зона «Навои» была создана в стране в 2008 году, то сегодня действуют 24 свободные экономические зоны.

Такие факторы, как повышение эффективности создаваемых особых экономических зон, разработка конкретных критериев отбора проектов для

размещения проектов на территориях свободных экономических зон, количество создаваемых рабочих мест при рассмотрении инвестиционных проектов, обеспечение достоверности потенциального иностранного партнер, внутренний и внешний спрос на продукцию, исследование объемов экспорта, устранение бюрократических препятствий в механизме утверждения инвестиционных проектов, своевременное строительство необходимой инженерно-коммуникационной инфраструктуры для функционирования свободных экономических зон, обеспечение предлагаемых инвестиционных проектов местными и зарубежными кредитными ресурсами, активизация деятельности прикрепленных к ним коммерческих банков, повышение эффективности использования производственных мощностей предприятий, работающих в свободных экономических зонах, обеспечение увеличения объемов производства и экспорта, количества созданных рабочих мест, соответствуют параметрам утвержденного бизнес-плана, определены задачи по обеспечению. Эффективная реализация этих задач демонстрирует актуальность научных исследований, направленных на разработку путей повышения уровня эффективности путем анализа текущего состояния особых экономических зон, прогнозирования и оценки их возможного будущего состояния.

Анализ литературы по теме. По результатам исследований ученых по особым экономическим зонам, доходы успешных особых экономических зон занимают 5-е место в ВВП страны, а также около 40-60% валового объема экспорта страны, от 30% до 80%. всех иностранных инвестиций поступает через специальные экономические зоны. Вопросы исследования развития особых экономических зон, оценки их эффективности, аспекты, которые следует изучить при организации экономических зон, П.Радослав[2], С.Вен[3] в научных исследованиях свободные экономические зоны друг от друга научно исследованы путем дифференциации.

Также в исследованиях ученых стран СНГ, в том числе Игнатова В.Г., Бутова В.И.[4], Кулдашевой М, Файзиевой Ш., Самиевой Г., Юлдашевой Ш[9], в своих научных исследованиях обозначают вопросы выявления эффективных и неэффективных СЭЗ.

Эффективное функционирование экономических зон, анализ их деятельности, прогнозные уровни объёма производства, цели, виды, правовые основы создания свободных экономических зон от узбекских экономистов, отразили в исследованиях систему оценки эффективности свободных экономических зон с точки зрения абсолютных и относительных показателей.

Методология исследования. При обосновании целей и основных особенностей создания особой экономической зоны в регионе вопросы, направленные на совершенствование методического обеспечения ее реализации, поясняются с помощью логического мышления, сравнительного анализа, обзорно-экономического анализа и системного анализа.

Анализ и результаты. Особые экономические зоны выполняют экономические, инновационные, ресурсные, организационные и социальные

функции в рамках обеспечения экономической стабильности и социального благополучия государства. Функции специальной экономической зоны имеют характеристики постоянства, производства товаров и услуг для потребителей, формирования новых идей, новых инструментов, факторов и технологий, рациональной и эффективной интеграции ресурсов и факторов производства, реализации тактических и стратегических цели. Создание специальных экономических зон служит увеличению числа предпринимателей в обществе, созданию рабочих мест, повышению уровня жизни и социального статуса работников.

Создание специальных экономических зон будет осуществляться в рамках действующей в стране социально-экономической системы.

Можно сказать, что создание особых экономических зон призвано поддержать людей, способных к предпринимательской деятельности, создать новые рабочие места, увеличить доходы работников, повысить их квалификацию, получить культурный отдых и улучшить здоровье, оказать практическую помощь для обеспечения семейного благополучия. а также региональная социальная инфраструктура представляет собой развитие.

Создание специальных экономических зон:

- формирование энтузиазма к предпринимательству и рост предпринимательства;
- создание новых рабочих мест;
- формирование приемлемых доходов;
- организация благоприятных условий труда;
- создание социальной инфраструктуры для населения.

Организация специальных экономических зон формируется на основе социально-экономических моделей, действующих в государствах.

«Специальные экономические зоны – это ограниченные территории, города, морские и воздушные порты, в которых применяются особые льготные экономические условия для отечественных и иностранных предпринимателей, способствующие решению внешнеторговых, общеэкономических, социальных, научно-технических и научно-технологических вопросов.

Считаем целесообразным создание специальных экономических зон на основе следующих принципов, исходя из вышеизложенных особенностей создания специальных экономических зон и их реализации в контексте различных социальных моделей:

- возраст человека должен цениться одинаково независимо от производительности труда, то есть принцип социальной помощи для всех;
- социальная помощь должна иметь принцип постоянства;
- социальная помощь должна быть адаптируемой ко всем условиям, направленной на выравнивание социального положения работников.

Мы считаем, что создание специальных экономических зон должно стать жизненно важной идеей сегодняшнего дня. Потому что создание специальных экономических зон – это самосознание, формирование имиджа,

новаторство и стремление к цели узбекского предпринимателя. Предприниматели этого же направления продвигают новые модели развития «Нового Узбекистана».

В мировой практике существует два пути организации особых экономических зон.

Первый – «территориальный подход», то есть особые экономические зоны рассматриваются как конкретные территории, на которых вводится определенный преференциальный режим.

Второй подход – «системный»: особые экономические зоны рассматриваются как отдельные коллективные предприятия, которым при определенных условиях предоставляются определенные льготы.

Углубленное и всестороннее изучение деятельности особых экономических зон в мировой науке началось в 70-х годах XX века.

В современной научной литературе, распорядительных документах, а также на практике для особых экономических зон используются разные термины: «Особая экономическая зона», «Технологическая зона», «Особая таможенная зона», «Особая экономическая зона», «Особая бизнес-зона», «Специальная экономическая зона», «Специальная экспортная зона», «Особая торговая зона», «Зона беспошлинной торговли», «Зона совместного предпринимательства».

Международные организации используют термин «Особая экономическая зона» в своих отчетах и научных публикациях для объяснения сути различных территорий.

Однако этот термин не может полностью выразить его суть. Применяемые там экономические правила, специальные административные законы не освобождают полностью предпринимателей, действующих в этой сфере, от четко определенных правовых и экономических режимов, но облегчают их и дают определенные льготы. Именно поэтому СЭЗ следует называть особой экономической зоной, а не «Специальные».

Особая экономическая зона - создание новых производств, развитие высокотехнологичного производства, активное участие в развитии производства современной конкурентоспособной, импортозамещающей, экспортоориентированной готовой промышленной продукции, а также производства, инженерных коммуникаций, автомобильного транспорта, социальная инфраструктура и логистика – территория, созданная с целью обеспечения развития сферы услуг. Специальная научно-технологическая зона – это территория, на которой с этой целью собираются научные организации и другие организации в сфере научной деятельности (технологические парки, центры распространения (трансфера технологий), инновационные кластеры, венчурные фонды, бизнес-инкубаторы и т.п.). развития инновационной инфраструктуры.

Основными экономическими целями создания специальных экономических зон могут быть:

➤ привлечение иностранного и национального капитала посредством

специальных льготных экономических механизмов, стабильной правовой базы и упрощения различных организационных процессов;

➤ использовать преимущества международного географического разделения труда и международного обращения капитала для расширения экспорта готовой продукции, организации рационального механизма импорта и импортозамещения производства;

➤ рост валютных поступлений в бюджет страны и региона;

➤ различные формы ТЭЗ; ликвидация монополий внешней торговли путем открытия дороги всем организациям и предприятиям СЭЗ.

Выводы. Во-первых, основная цель создания СЭЗ в стране – более глубокое вовлечение страны в процесс развития международного разделения труда. Во-вторых, еще одной целью создания СЭЗ является насыщение внутреннего рынка страны качественной продукцией, способной заменить импортные товары. В-третьих, организаторы специальной экономической зоны не уделяют внимание участию на международном торговом рынке только по линии производства, но уделяют внимание и сфере туризма, сфере культуры, санаторно-курортной сфере. В-четвертых, цель СЭЗ – обеспечить более быстрое и широкое использование отечественных и зарубежных научных технологий в производстве, их эффективное использование в будущем, отражение их результатов в развитии народного хозяйства страны. В-пятых, целью СЭЗ, созданных в развивающихся странах, является повышение подготовки и квалификации рабочей силы страны, инженеров, экономических работников и управленческого персонала. В-шестых, одной из важных целей СЭЗ является стимулирование развития экономики в определенной сфере или развитие конкретной отрасли.

В-седьмых, в некоторых странах СЭЗ рассматривают как способ модернизации и развития определенного региона. СЭЗ поможет перейти от господствующего в стране типа экономики к современной рыночной экономике.

Если сделать вывод из вышеизложенного, то важно определить цели и задачи специальных экономических зон, прежде всего, по ускоренному развитию регионов и решению экономических и социальных проблем.

Использованные источники:

1. Закон Республики Узбекистан «О специальных экономических зонах». ORQ-604.17.02.2020. <https://lex.uz/docs/4737511>
2. Radoslaw P “Special Economic Zones effectiveness assessment based on the adjusted enclave model. The Case of Poland”, Dissertatsiya, 2016.
3. S.Ven “Special Economic Zones as a Tool for Accelerating Economic Growth”. Dissertatsiya. Kombodja Taraqqiyot Instituti, PhD, 2018.
4. Игнатов В. Г., Бутов В.И. – “Свободные экономические зоны” – Москва, 1997 г. с.22-30;
5. Kuldasheva M. SPECIFIC FEATURES OF ENTREPRENEURSHIP IN INCREASING THE INCOME OF THE POPULATION IN THE REGION //Innovation Science and Technology. – 2025. – Т. 1. – №. 12.

6. Fayziyeva S., Samiyeva G., Yuldosheva S. Possibilities of using economic mechanisms when organizing fruit and vegetable cooperatives //E3S Web of Conferences. – EDP Sciences, 2024. – T. 539. – C. 02024.
7. FAYZIEVA S. S. The importance of economic reforms in the modernization and development of the livestock sector //Journal of Contemporary Issues in Business and Government. – 2021. – T. 2021. – C. 4052.
8. Taylakova D. B. TRADITIONAL APPROACHES TO IMPROVING THE SERVICE SECTOR IN RURAL AREAS. – 2025.
9. Taylakova D. B. WAYS TO INCREASE EMPLOYMENT THROUGH DEVELOPING THE SERVICE SECTOR. – 2025.
10. Khojakulova N. R. Prospects For Further Development Of Medicinal Plants //International Journal of Innovations in Engineering Research and Technology. – №. 1. – C. 1-8.
11. Rustamovna K. N. The Role and Importance of Medicinal Plants in the Development of the Pharmaceutical Industry //International Journal of Management IT and Engineering. – 2022. – T. 12. – №. 3. – C. 88-93.

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МИЛЛИЙ БОҒ ВА ҚУРИҚХОНА, БУЮРТМАЛАРНИНГ ТАБИАТНИ МУҲОФАЗА ҚИЛИШДАГИ ЎРНИ ВА АҲАМИЯТИ

Аннотация: Табиат муҳофазаси доимо долзарб вазифалардан бўлиб, Ўзбекистон Республикаси ҳудудида бу борада қўриқхоналар, миллий боғлар ва буюртма масканларининг ўрни ва аҳамияти ушбу мақолада ёритиб берилган.

Калит сўзлар; қўриқхоналар, миллий боғлар, буюртмахоналар, ландшафтларни муҳофаза қилиш, табиат ёдгорликлари.

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THE ROLE AND IMPORTANCE OF NATIONAL PARKS, RESERVES AND SANCTUARIES IN NATURE CONSERVATION

Abstract: Nature conservation is always an urgent task, and this article examines the role and importance of nature reserves, national parks and sanctuaries in this regard in the Republic of Uzbekistan.

Key words: nature reserves, national parks, wildlife refuges, landscape protection, natural monuments.

Кириш. Маълумки, 1972 йилда Бирлашган Миллатлар Ташкилотининг Стокгольм шаҳрида ўтказилган конференцияси қарорига мувофиқ, 5 июнь “Бутунжаҳон атроф-муҳитни муҳофаза қилиш куни” деб эълон қилинган эди. Дунёнинг кўплаб мамлакатлари мутахассислари иштирокида бўлиб ўтган мазкур анжуманда шундай хулосага келиниши бежиз эмас. Чунки ўша даврдаёқ бу ҳаётини муҳим масала мамлакатлар, мутахассислар, умуман, жамоатчилик олдидаги долзарб вазифалардан бирига айланганди.

Асосий қисм. Ландшафт компонентлари инсон яшайдиган аниқ (конкрет) муҳит ҳисобланиб, уни ҳар қандай кўнгилсиз ва нооқилона ўзгиришлар ҳамда ифлосланишлардан муҳофаза қилиш зарур.

Ландшафтларни муҳофаза қилиш деганда, биз унинг унсурларини иложи борича тоза сақлаш, ундаги мувозанатнинг бузилишига йўл қўймаслик, табиатнинг ажойиб, такрорланмас жойларини табиий ҳолича сақлаб қолиш кабиларни тушунамиз.

Ландшафт ва унинг компонентларини турли шаклларда муҳофаза қилиш мумкин: ландшафтнинг бутун компонентларини тўла-тўқис муҳофаза қилиш; ландшафтнинг айрим ва ажойиб, диққатга сазовор жойларини муҳофаза қилиш. Ландшафтнинг бутун компонентларини муҳофаза қилишда қўриқхоналарнинг аҳамияти катта. Қўриқхоналар бу табиат эталони бўлиб, Республика табиатини муҳофаза қилишида қуйидаги вазифаларни бажаради: республикаимизнинг маълум бир қисми ёки географик минтақа табиатининг барча унсурлари намунаси табиий ҳолича келажак авлод учун сақлаб қолинади. Қўриқхона-бу табиати яхши сақланган жой ҳисобланиб, унда табиий ҳудудий комплексларнинг ривожланиш қонуниятини, ўзаро алоқасини, организм билан муҳит ўртасидаги муносабатлар илмий жиҳатдан ўрганиладиган табиий лабораториядир. Унда сони ва тури камайиб бораётган ўсимлик ва ҳайвонларни парвариш қилиб, кўпайтириб, муҳофазаси билан шуғулланади. Қўриқхоналар орқали табиатнинг ажойиб жойлари кенг омма орасида намоён этилади ва табиатни муҳофаза қилиш зарурлиги тарғибот қилинади. Ўзбекистон ҳудудида тўқай, чўл ва тоғ ландшафт компонентларини муҳофаза қилиш ва у ердаги табиат компонентларини, хусусан ўсимлик ҳайвонларнинг ҳаётини чуқур ўрганиш, кўпайтириш мақсадида Республикамизда 10 та қўриқхона ташкил этилган.

Республика ландшафтларини муҳофаза қилишда яна миллий боғлар, буюртмалар ва парваришхоналарнинг ҳам аҳамияти каттадир. Ўзбекистонда ҳозирча Зомин ва Угом, Чотқол миллий боғи мавжуд. Ўзбекистондаги буюртмаларнинг асосий вазифаси ноёб ўсимлик, ҳайвон турларини ёки ажойиб табиатли жойларни йўқ бўлиб кетишидан асрайди, ўсимлик ва ҳайвонларнинг кўпайиши учун шароит яратади. Буюртмалар ўзининг хусусиятига кўра вақтдан ва доимий бўлиши мумкин.

Ўзбекистон ландшафтининг ажойиб, диққатга сазовор жойларини сақлаб қолишда табиат ёдгорликларини муҳофаза остига олиш жуда муҳим аҳамиятга эга. Чунки илмий, маданий, тарихий ва эстетик жиҳатидан қимматли, ажойиб, ноёб табиатли жойларни муҳофаза қилиб, сақлаб қолиш учун катта майдонни эгалловчи қўриқхона ва буюртмалар барпо этиш шарт эмас. Уларни майдони жуда кичик бўлган «табиат ёдгорликлари» сифатида сақлаб қолиб, муҳофаза қилиш мумкин.

Табиат ёдгорликлари деганда биз ғорларни, карстларни, шаршара ва шовваларни, ажойиб булоқ, жилға ва сойларни, дараларни, қояли рельеф шаклларини, очилиб қолган ётқиқларни, тошқотган ҳайвонларни ва табиатнинг бошқа ажойиб жойларини тушунамиз.

Ўзбекистон ҳудудида 1000 га яқин табиат ёдгорликлари мавжуд. Лекин уларнинг кўпчилиги ҳисобга олинмаганлиги оқибатида ҳолати ёмонлашиб

бормокда. Шу сабабли зудлик билан ҳар бир қишлоқ, туман, вилоят ҳудудида мавжуд бўлган табиат ёдгорликларини назорат остига олиш зарур.

Табиат ёдгорликлари хусусиятларига қараб геологик, палеонтологик, географик, археологик ва биологик турларга бўлинади. Геологик ёдгорликларга табиатда очилиб қолган тоғ жинслари, карстлар, ғорлар, иссиқ сувли минерал булоқлар қабилар қиради. Ўзбекистондаги Қилси (Қирқтоғда), Қорлуғ (Қўхитанг тоғида), Ҳазратидавут (Зирабулоқ тоғида), Амир Темир ғорлари, Зарафшон тизмасидаги карстлар яққол мисолдир. Палеонтологик ёдгорликларга тошга айланган, лекин излари яхши сақланган ўсимлик ва, ҳайвон қолдиқлари учрайдиган жойлар қиради.

Географик ёдгорликлари жуда кўп бўлиб, унга ажойиб қоялар, шаршара ва шоввалар, даралар, танглар, ажойиб булоқлар, хушманзара жойлар қиради. Бунга Илонўтди (Амир Темур) дараси, Кўксув дарёсидаги шаршара, Нурота ва Ургутдаги булоқлар, Сурхондарёдаги Келиф Шеробод марзаси, Катта ва Кичик Чимён сойлиги, Оқтош сойлиги ва бошқалар қиради. Биологик ёдгорликларга ноёб, тури йўқолиб бораётган ўсимликлар, узок йил ўсаётган дарахтлар, тик ён бағирларда ва қумлар орасида сақланиб қолган ўсимликлар ва бошқалар қиради. Биологик ёдгорликларга Сурхондарё вилоятига қарашли Сайроб қишлоғидаги ёши 960 йиллик чинор, Бойсундаги Чорчинор, Ургут қишлоғидаги ёки 1014 йиллик Хўжа Чор Чинор, Хўжакентдаги булоқ ёнидаги чинор, Шофрикон атрофидаги саксовулзорлар мисол бўлади.

Археологик ёдгорликларга қадимги манзилгоҳ жойлар, қадимий шаҳар қолдиқлари, суғориш иншоотлари, қудуқлар, сардобалар, коризлар, бандлар қиради. Бунга қадимий Варданзи, Варахша (Бухоро вилоятларида), Афросиёб харобаси, Кўҳна Урганчдаги минора, Сурхондарё вилоятида сақланган ва ҳозирда ҳам аҳамиятини йўқотмаган.

Қадимий ёзув ва расмлари билан дунёга машҳур бўлган Зарауткамар ёдгорлиги, Нурота яқинида сақланган коризлар, чўллардаги сардобалар, Оқчоп сойлигидаги Абдуллахон банди (сув омбори) қолдиқлари яққол мисолдир.

Лекин, Ўзбекистон табиат ёдгорликларини ҳисобга олиш борасидаги ишлар яқин ўтмишда бошланди, бинобарин, бундан буён жамоатчилик кучи билан табиат ёдгорликларини ҳисобга олиб, уни тарқалиш харитасини тузиб, ҳимоя остига олиш керак. Шунингдек, ажойиб табиат ёдгорликларини ҳисобга олувчи Ўзбекистон «Кўк китоб»ини тузиш вақти келди.

Ўзбекистонда алоҳида муҳофаза остига олинган ҳудудлар текислик, тоғ олди ва тоғли районларда ташкил қилинган. Ушбу жойларда табиий ландшафтларни табиий ҳолда сақлаш, ўсимлик ва ҳайвонот дунёсини муҳофаза қилиш қатъий ишлаб чиқилган дастурлар асосида олиб борилмоқда. Ушбу дастурлар асосида бажарилаётган ишларни Ўзбекистон Республикаси табиатни муҳофаза қилиш давлат қўмитаси ва уларнинг вилоятлар, туманлардаги таркибий бўлинмалари назоратлари остида амалга оширилиб келинмоқда ва ривожлантирилмоқда.

Ўзбекистон Республикаси табиатни муҳофаза қилиш давлат қўмитаси ва унинг таркибий бўлинмалари ўз фаолиятларини Ўзбекистон Республикаси Вазирлар Маҳкамасининг 2009 йил 13 февралда бўлиб ўтган “2008 йилда республиканинг ижтимоий-иқтисодий ривожлантириш якунлари ва 2009 йилда иқтисодий ислохатларни янада чуқурлаштиришнинг муҳим устивор йўналишлари”га бағишланган мажлисида Ўзбекистон Республикаси Президенти томонидан белгилаб берилган. Ушбу қарорга мувофиқ, табиатни муҳофаза қилиш давлат қўмитаси ҳайъат йиғилишларида фаолиятнинг 2009 йилдаги муҳим устивор вазифалари алоҳида кўриб чиқилган ва вазифалар белгиланган. Ўзбекистон Республикаси табиатни муҳофаза қилиш давлат қўмитаси Раисининг Ўзбекистон Республикаси Табиатни муҳофаза қилиш давлат қўмитасининг “2008 йилдаги фаолияти ҳақидаги ҳисоботи тўғрисидаги Ўзбекистон Республикаси Олий Мажлис Сенатининг 2009 йил 28 мартдаги 641/1 сонли ва Ўзбекистон Республикаси Олий Мажлис Сенатининг Аграр-сув хўжалиги масалалари ва экологик қўмитасининг 2009 йил 27 февралдаги 32-сонли қарорини” бажариш мақсадида қўмита таркиби кенгайтирилган. Бундан асосий мақсад табиий ландшафтларни ўз ҳолича сақлаб қолиш, муҳофазага олинган ҳудудлардаги тупроқ, ўсимлик ва ҳайвонот дунёнинг турларини сақлаб қолишга қаратилганлиги билан ҳам муҳим аҳамиятга эгадир.

Ўзбекистон Республикаси ўз мустақилликка эришгандан сўнг атроф-муҳитни муҳофаза қилишга табиий ресурслардан оқилона фойдаланишга катта эътибор қаратмоқда. Бугунги кунда Ўзбекистонда атроф-муҳитни муҳофаза қилиш ва табиий ресурслардан оқилона фойдаланишга қаратилган 20 дан ортиқ қонун, 350 дан ортиқ ҳукумат қарорлари қабул қилинган. Мамлакатимизда юз бераётган экологик вазиятларни соғломлаштириш, биологик хилма-хилликни сақлаш, энг асосийси халқнинг ижтимоий-иқтисодий турмуш даражасини яхшилаш мақсадида Бирлашган Миллатлар Ташкилотининг Тараққиёт дастури кўмагида биргина Қорақалпоғистон Республикасида ўрта масштабдаги 47 та экологик лойиҳа амалга оширилган. Бундан ташқари 2006 йилдан бошлаб Амударё дельтасида қиймати 1,18 млн АҚШ доллар бўлган “Тўқайларни сақлаб қолиш ва муҳофаза қилинадиган ҳудудлар тизимини мустаҳкамлаш” лойиҳаси, 2010-йилдан бошлаб эса “Устюрт платосида сайғоқларни сақлаб қолиш” лойиҳалари ишлаб чиқилди. Ушбу лойиҳаларнинг амалга оширилиши натижасида муҳофаза қилиниши лозим бўлган янги ҳудудларда муҳофаза қилишга оид чора-тадбирларнинг ишлаб чиқилиши табиий муҳитни сақлаб қолишга катта ҳисса қўшмоқда.

Ўзбекистон Республикаси мустақил ривожланиш йилларида босиб ўтилган йўллар ва эришилган ютуқларни сарҳисоб қилинганда, мамлакатимиз Президенти томонидан республикаимизда иқтисодиётнинг турли тармоқларида ижтимоий-иқтисодий ислохатларда, хусусан атроф- муҳитни муҳофаза қилиш ва табиий ресурслардан оқилона фойдаланиш соҳасида салмоқли ютуқларга эришганлиги таъкидлаб ўтилган. Ўзбекистон Республикаси барқарор ижтимоий-иқтисодий ривожланишга ўтмишнинг

мақсад ва вазифаларига мувофиқ табиатни муҳофаза қонунчилиги такомиллаштирилмоқда. Атроф-муҳит соҳасига қатор стратегик ҳужжатлар, мамлакатимиз иқтисодиётининг асосий тармоқларини қайта техник ислоҳ қилишга йўналтирилган ҳукумат қарорлари қабул қилинган ва улар амалга оширилмоқда. Табиатни муҳофаза қилиш тадбирларининг амалга оширилиши натижасида республика бўйича экологик ҳолатнинг барқарорлашув тенденцияси кузатилмоқда. Барқарор ривожланиш хусусан, табиий муҳитни муҳофаза қилиш, аҳоли саломатлиги ва фаровонлигини таъминлаш учун сув ресурсларининг аҳамиятини ҳисобга олган ҳолда Ўзбекистоннинг муҳофаза қилинадиган ҳудудларида сув ресурсларини комплекс бошқарув тизимини ривожлантиришга улардан самарали фойдаланиш ҳамда сув таъминоти ва санитария-гигиена масалалари бўйича халқаро даражада қабул қилинган мажбуриятларни бажаришга интиломоқда. Бунда сув ресурсларни муҳофаза қилиш, улардан оқилона фойдаланиш ва бошқарувни такомиллаштиришга алоҳида эътибор қаратилмоқда.

Хулоса ва таклифлар. Табиий муҳит муҳофазаси ва шу мақсадларга ажратилган ресурслардан оқилона фойдаланиш борасида қабул қилинган ҳужжатларни ижро этишда республикаимизнинг табиатни муҳофаза қилиш марказлари ва жойлардаги давлат органлари, жамоатчилик ва бошқа тузилмалар маъсулиятини ошириш лозим. Муҳофаза этиладиган табиий ҳудудлар ва объектлар, сув, сувдан фойдаланиш, ер, ер ости бойликлари, атмосфера ҳавосини муҳофаза қилиш, ўрмонлар, ўсимлик ва ҳайвонот дунёсини муҳофаза қилиш ва улардан фойдаланиш тўғрисида чиқарилган қарорларни республика табиатини муҳофаза қилишга қаратилишини қатъий назоратга олиш мақсадга мувофиқдир.

Использованные источники:

1. Султонов П.С. Экология ва атроф-муҳитни муҳофаза қилиш асослари. Тошкент 2007. 58-77 б.
2. Баратов А.С., Қориев М.Р. Атроф-муҳит муҳофазаси. Ўқув услубий мажмуа. Нам ДУ, 2023. 36-38 б.
3. Қодиров Э.В., Шерматов М.Ш., Акбаров Х.А., Мавлонов Э.В. ва бошқалар “Табиий муҳитни муҳофазалашнинг геоэкологик асослари” –Т.: “Ўзбекистон” 1999.-82б.
4. Эшбоев Б.Т. Топонимы Кашкадарьинской области. - Монография. Узбекистан, Карши -2021.
5. Тожиэвич Э. Б., Гелдиярович Н. М. Эхпланатион Оф Оронймс Анд Орограпҳис Термс Оф Кашкадаря Регион //Жоурнал оф Сонтемпорарй Иссуэс ин Бусинесс анд Говернмент. – Т. 2021.
6. Эшбоев Б., Абдураимов Б. Натурал геограпҳисал проблемс оф усинг тхе моунтаин анд неар-моунтаин ареас оф Кашкадаря регион //Экономика и социум. – 2024. – №. 5-1 (120). – С. 275-278.
7. Эшбоев Б., Халилова Э. Форматион оф натурал геограпҳисал просэссес ундер тхе инфлуэнсэ оф тхе геологисал анд геоморпҳологй чарактеристисс оф тхе ареал //Экономика и социум. – 2024. – №. 3-1 (118). – С. 159-162.

8. Эшбоев Б.Т. Гидронимлар ва географик терминларнинг жой номларида акс этиши //Общества Узбекистана. – С. 117.
9. Исаченко А.Г. Ландшафтно-географические основы рационального использования, преобразования и охраны природной среды. – В сб: “Человек и среда обитания”. Л., 1974.
10. Эшбоев Б.Т. Тхе роле оф геограпхис термс дефинитион хигх релиэф формс ин тхе форматион оф оронймс. Просэедингс оф Интернационал Конференсэ он Модерн Ссиэнсэ анд Ссиэнтифис Студизс. Франсэ, Парис. Вол. 2. Но. 4. 2023.
11. Бехзод Э. Шохбоз Й. Ўзбекистон оронимларммиг шаклланиш хусусиятлари ва лисоний тахлили //Инноватионс ин Течнологй анд Ссиэнсэ Эдусатион. – 2023. – Т. 2. – №. 8. – С. 697-701.
12. Тожиевич Э.Б., Эркиновна К.М. Плассе намес оф тхе Кашкадаря регион ассосиатед витх климатис анд метеорологисал феатурес //Збиор артикулów наукойч ресэнзованийч. – С. 51.
13. Суюнов А., Суюнов С., Кхушмуродов Ф., Суюнов С., Омонов, И., Эшбоев Б. Эсологисал сонсекуэнсэс оф тхе десертифисатион просэсс ин тхе агроландскапес оф тхе Кашкадаря оасис. Ин БИО Wэб оф Конференсэс (Вол. 160, п. 02006). ЭДП Ссиэнсэс. 2025.
14. Эшбоев Б.Т., Худойбердиев Ж.Ж. Релатионс оф пласэ намес оф Кашкадаря регион витх мисрослимате //Экономика и социум. – 2023. – №. 10 (113)-2. – С. 108-111.

РАЦИОНАЛИЗАЦИЯ ТАКТИКИ ВЕДЕНИЯ ПАЦИЕНТОК С АНОМАЛЬНЫМИ МАТОЧНЫМИ КРОВОТЕЧЕНИЯМИ РЕПРОДУКТИВНОГО ВОЗРАСТА

Резюме: Аномальные маточные кровотечения (АМК) у женщин репродуктивного возраста являются одной из наиболее частых причин обращения за специализированной гинекологической помощью и нередко приводят к развитию железодефицитной анемии, снижению качества жизни и необоснованным хирургическим вмешательствам. Многофакторный характер патогенеза АМК, включающий гормональные, структурные и гемостатические нарушения, требует внедрения рациональных и стандартизированных подходов к ведению пациенток. Целью настоящей работы является рационализация тактики ведения пациенток с аномальными маточными кровотечениями репродуктивного возраста на основе комплексной клинико-инструментальной и лабораторной оценки. В статье рассматриваются современные диагностические критерии, классификация PALM–COEIN, а также эффективность персонализированного консервативного лечения. Применение рационализированного алгоритма ведения позволяет снизить частоту рецидивов кровотечений, уменьшить потребность в инвазивных вмешательствах и улучшить клинические исходы.

Ключевые слова: аномальные маточные кровотечения, репродуктивный возраст, PALM–COEIN, гормональные нарушения, тактика ведения, гинекология.

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RATIONALIZATION OF MANAGEMENT TACTICS FOR PATIENTS WITH ABNORMAL UTERINE BLEEDING OF REPRODUCTIVE AGE

Resume: Abnormal uterine bleeding (AUB) in women of reproductive age is one of the most common gynecological conditions, often leading to iron deficiency anemia, decreased quality of life, and unnecessary surgical interventions. The

multifactorial pathogenesis of AUB, including hormonal imbalance, structural endometrial abnormalities, and hemostatic disorders, necessitates the development of rational and standardized management approaches. The aim of this study is to rationalize management tactics for patients with abnormal uterine bleeding of reproductive age based on comprehensive clinical, instrumental, and laboratory assessment. The article discusses modern diagnostic criteria, the PALM–COEIN classification, and the effectiveness of personalized conservative treatment strategies. Implementation of a rationalized management algorithm contributes to reducing recurrence rates, minimizing invasive procedures, and improving clinical outcomes.

Key words: *abnormal uterine bleeding, reproductive age, PALM–COEIN classification, hormonal disorders, management tactics, gynecology.*

Актуальность. Аномальные маточные кровотечения у женщин репродуктивного возраста представляют собой одну из наиболее актуальных и сложных проблем современной гинекологии, что обусловлено их высокой распространённостью, многообразием клинических проявлений и значительным влиянием на соматическое, репродуктивное и психоэмоциональное здоровье пациенток.

По данным различных эпидемиологических исследований, до 30–40% женщин репродуктивного возраста хотя бы один раз в жизни сталкиваются с эпизодами аномальных маточных кровотечений, а в структуре обращаемости за специализированной гинекологической помощью данная патология занимает одно из ведущих мест [3,8]. Несмотря на наличие современных диагностических и лечебных возможностей, проблема АМК остаётся недостаточно решённой, что обуславливает необходимость дальнейшего совершенствования тактики ведения данной категории пациенток.

Актуальность аномальных маточных кровотечений определяется, прежде всего, их выраженным медико-социальным значением. Длительные или обильные кровотечения приводят к развитию железодефицитной анемии различной степени тяжести, снижению работоспособности, ухудшению качества жизни и формированию хронического астенического синдрома [1]. У женщин репродуктивного возраста АМК нередко сопровождаются нарушениями менструальной функции, бесплодием, невынашиванием беременности и снижением репродуктивного потенциала, что придаёт данной проблеме особую значимость в условиях демографических вызовов и необходимости сохранения репродуктивного здоровья населения [10].

Следует отметить, что аномальные маточные кровотечения являются не самостоятельным заболеванием, а клиническим синдромом, объединяющим широкий спектр патологических состояний, различающихся по этиологии, патогенезу и клиническому течению. Именно многофакторность происхождения АМК создаёт существенные трудности для диагностики и выбора оптимальной лечебной тактики. В клинической практике нередко наблюдается ситуация, при которой терапевтические мероприятия носят

симптоматический характер и не учитывают ведущие патогенетические механизмы, что снижает их эффективность и способствует рецидивированию кровотечений [6].

Особую проблему представляют аномальные маточные кровотечения у женщин активного репродуктивного возраста, когда на первый план выходят не только вопросы купирования кровопотери, но и сохранения фертильности. Необоснованное применение радикальных хирургических методов лечения, включая диагностические и лечебные выскабливания, а в ряде случаев и гистерэктомию, может приводить к утрате репродуктивной функции и формированию ятрогенных осложнений [4]. В этой связи рационализация тактики ведения пациенток с АМК приобретает особую клиническую и этическую значимость.

Современные данные свидетельствуют о том, что в основе аномальных маточных кровотечений лежит сложное взаимодействие гормональных, структурных и гемостатических факторов. Нарушения регуляции гипоталамо-гипофизарно-яичниковой системы приводят к дисбалансу стероидных гормонов, изменению процессов пролиферации и секреции эндометрия, а также к нарушению механизмов локального гемостаза [9]. Эти процессы особенно выражены в репродуктивном возрасте, когда эндокринная система функционирует в условиях высокой гормональной нагрузки и подвержена влиянию стрессовых, метаболических и воспалительных факторов.

Помимо эндокринных нарушений, важную роль в развитии АМК играют структурные изменения матки и эндометрия, включая миому матки, полипы эндометрия, аденомиоз и хронические воспалительные процессы. Эти состояния не только способствуют возникновению кровотечений, но и существенно осложняют диагностику, особенно при сочетанных формах патологии [2]. В клинической практике нередко встречаются случаи, когда у одной пациентки одновременно присутствуют несколько причинных факторов, что требует комплексного и индивидуализированного подхода к обследованию и лечению.

Отдельного внимания заслуживает роль нарушений системы гемостаза в формировании аномальных маточных кровотечений. Современные исследования указывают на то, что у значительной части пациенток с АМК выявляются как врождённые, так и приобретённые коагулопатии, которые могут оставаться недиагностированными на протяжении длительного времени [11]. Отсутствие рутинного скрининга гемостатических нарушений приводит к повторяющимся эпизодам кровотечений и неэффективности стандартной гормональной терапии.

Несмотря на внедрение международной классификации PALM–COEIN, направленной на стандартизацию диагностики аномальных маточных кровотечений, в реальной клинической практике сохраняются значительные трудности в её полноценном применении. Нередко классификация используется формально, без углублённого анализа патогенетических механизмов, что ограничивает её практическую ценность [5]. Это

подчёркивает необходимость не только использования классификационных подходов, но и их интеграции в рациональные алгоритмы ведения пациенток.

Важным аспектом проблемы АМК является высокая частота рецидивов после проведённого лечения. Даже при использовании современных медикаментозных средств значительная часть пациенток отмечает повторное возникновение кровотечений в течение первого года наблюдения [7]. Это свидетельствует о том, что существующие подходы зачастую не обеспечивают долгосрочного клинического эффекта и требуют пересмотра с позиции персонализированной медицины.

Таким образом, аномальные маточные кровотечения у женщин репродуктивного возраста представляют собой многоаспектную клиническую проблему, затрагивающую не только гинекологические, но и общесоматические, репродуктивные и социальные аспекты здоровья. Высокая распространённость АМК, их негативное влияние на качество жизни, риск развития анемии и репродуктивных нарушений, а также отсутствие единых рациональных алгоритмов ведения обуславливают необходимость дальнейших научных исследований в данном направлении [1,6,8]. Рационализация тактики ведения пациенток с АМК с учётом современных диагностических возможностей и патогенетических особенностей является актуальной задачей современной гинекологии и важным условием повышения качества медицинской помощи женщинам репродуктивного возраста [3,10].

Цель исследования. Целью исследования является рационализация тактики ведения пациенток с аномальными маточными кровотечениями репродуктивного возраста на основе комплексной клинко-инструментальной и лабораторной оценки с учётом этиопатогенетических механизмов заболевания с целью снижения частоты рецидивов кровотечений, уменьшения потребности в инвазивных вмешательствах и улучшения репродуктивных и клинических исходов.

Материалы и методы исследования. В исследование были включены пациентки репродуктивного возраста с клиническими проявлениями аномальных маточных кровотечений, диагностированных в соответствии с современными клинко-диагностическими критериями. Формирование выборки осуществлялось с учётом критериев включения и исключения. Критериями включения являлись наличие эпизодов аномальных маточных кровотечений, подтверждённых клинически и инструментально, возраст от 18 до 45 лет, а также добровольное информированное согласие на участие в исследовании. Критериями исключения служили беременность, злокачественные новообразования органов репродуктивной системы, тяжёлые экстрагенитальные заболевания в стадии декомпенсации, врождённые коагулопатии, а также острые воспалительные процессы.

Все обследованные пациентки были распределены на группы в зависимости от ведущего этиопатогенетического варианта аномальных

маточных кровотечений согласно классификации PALM–COEIN. Контрольную группу составили женщины репродуктивного возраста с регулярным менструальным циклом и отсутствием признаков маточной патологии. Сравнительный анализ между группами позволил оценить эффективность предложенной рационализированной тактики ведения.

Результаты исследования. В ходе проведённого исследования были проанализированы клинические, инструментальные и лабораторные показатели у пациенток репродуктивного возраста с аномальными маточными кровотечениями, а также оценена эффективность рационализированной тактики ведения в сравнении с традиционными подходами. Полученные результаты позволили выявить основные закономерности течения АМК, определить ведущие этиопатогенетические факторы и оценить влияние комплексного индивидуализированного подхода на клинические исходы.

Анализ клинических данных показал, что у большинства обследованных пациенток аномальные маточные кровотечения носили рецидивирующий характер и сопровождались выраженными нарушениями менструального цикла. Наиболее частыми жалобами являлись удлинение менструаций, увеличение объёма кровопотери, межменструальные кровянистые выделения, а также симптомы анемического синдрома, включая слабость, головокружение и снижение работоспособности. При этом длительность заболевания у значительной части женщин превышала один год, что свидетельствует о хроническом характере патологического процесса и недостаточной эффективности ранее проводимого лечения.

Распределение пациенток по классификации PALM–COEIN показало, что наиболее часто встречались неструктурные причины аномальных маточных кровотечений, связанные с овуляторной дисфункцией и нарушениями гормональной регуляции. Структурные формы АМК, включая полипы эндометрия, миому матки и аденомиоз, выявлялись реже, однако отличались более выраженной клинической симптоматикой и устойчивостью к консервативной терапии. Сочетанные варианты патологии наблюдались у значительной части пациенток, что подчёркивает сложность этиопатогенеза АМК и необходимость комплексного подхода к их диагностике и лечению.

Лабораторное обследование выявило, что у большинства пациенток с АМК имелись признаки железодефицитной анемии различной степени выраженности. Снижение уровня гемоглобина сочеталось с уменьшением показателей эритроцитарного ростка, что коррелировало с длительностью и интенсивностью кровотечений. Кроме того, у части пациенток были выявлены нарушения системы гемостаза, проявлявшиеся изменениями показателей коагулограммы, что могло способствовать поддержанию и рецидивированию кровотечений.

Гормональный профиль обследованных женщин характеризовался высокой вариабельностью. У пациенток с овуляторной дисфункцией отмечались признаки гипо- или гиперэстрогении, относительной или абсолютной недостаточности прогестерона, а также нарушения секреции

гонадотропных гормонов. Эти изменения способствовали развитию дискоординации процессов пролиферации и десквамации эндометрия, что являлось одним из ключевых механизмов формирования аномальных маточных кровотечений.

Инструментальные методы исследования подтвердили наличие структурных изменений эндометрия и миометрия у части пациенток. Ультразвуковое исследование органов малого таза позволило выявить утолщение эндометрия, неоднородность его эхоструктуры, наличие очаговых образований, а также признаки аденомиоза. Гистологическое исследование эндометрия у пациенток, которым проводилась диагностическая гистероскопия, выявило преобладание пролиферативных изменений, простую гиперплазию эндометрия без атипии и воспалительные изменения слизистой оболочки матки.

Внедрение рационализированной тактики ведения, основанной на комплексной клинко-инструментальной и лабораторной оценке, позволило существенно улучшить клинические результаты лечения. Индивидуализированный выбор терапевтических мероприятий с учётом этиопатогенетического варианта АМК способствовал более быстрому купированию кровотечений, снижению их интенсивности и уменьшению частоты рецидивов. У большинства пациенток отмечалась нормализация менструального цикла в течение первых месяцев наблюдения.

Особое значение имело снижение потребности в инвазивных диагностических и лечебных вмешательствах. При использовании рационализированного алгоритма ведения значительно уменьшилось число повторных выскабливаний полости матки и других травматичных процедур, что способствовало сохранению репродуктивной функции и снижению риска ятрогенных осложнений. Это особенно важно для женщин репродуктивного возраста, заинтересованных в сохранении фертильности.

Динамическое наблюдение за пациентками показало положительную тенденцию в восстановлении гематологических показателей. На фоне адекватной коррекции кровопотери и проведения патогенетически обоснованной терапии отмечалось повышение уровня гемоглобина и улучшение общего самочувствия женщин. Улучшение клинического состояния сопровождалось повышением качества жизни и снижением выраженности психоэмоциональных нарушений, связанных с хроническими кровотечениями.

Сравнительный анализ результатов лечения до и после внедрения рационализированной тактики ведения продемонстрировал её высокую клиническую эффективность. Частота рецидивов аномальных маточных кровотечений в течение периода наблюдения была значительно ниже у пациенток, получавших лечение на основе комплексного подхода, по сравнению с женщинами, которым ранее применялись стандартные схемы терапии. Это подтверждает целесообразность использования персонализированных алгоритмов ведения пациенток с АМК.

Обобщённые результаты исследования представлены в таблице 1, отражающей динамику основных клинико-лабораторных показателей у пациенток с аномальными маточными кровотечениями на фоне рационализированной тактики ведения.

Таблица 1.

Динамика клинико-лабораторных показателей у пациенток с АМК ($M \pm m$).

Показатель	До лечения	После лечения
Длительность кровотечения, дни	$9,6 \pm 1,2$	$5,1 \pm 0,8^*$
Частота рецидивов, %	48,3	18,7*
Гемоглобин, г/л	$98,4 \pm 4,6$	$116,9 \pm 3,8^*$
Толщина эндометрия, мм	$14,2 \pm 1,5$	$8,6 \pm 1,1^*$
Потребность в инвазивных вмешательствах, %	34,5	12,1*

***Примечание:** * — различия статистически значимы по сравнению с исходными показателями ($p < 0,05$).

Таким образом, результаты исследования свидетельствуют о том, что рационализация тактики ведения пациенток с аномальными маточными кровотечениями репродуктивного возраста на основе комплексной оценки клинических, инструментальных и лабораторных данных является эффективным и обоснованным подходом.

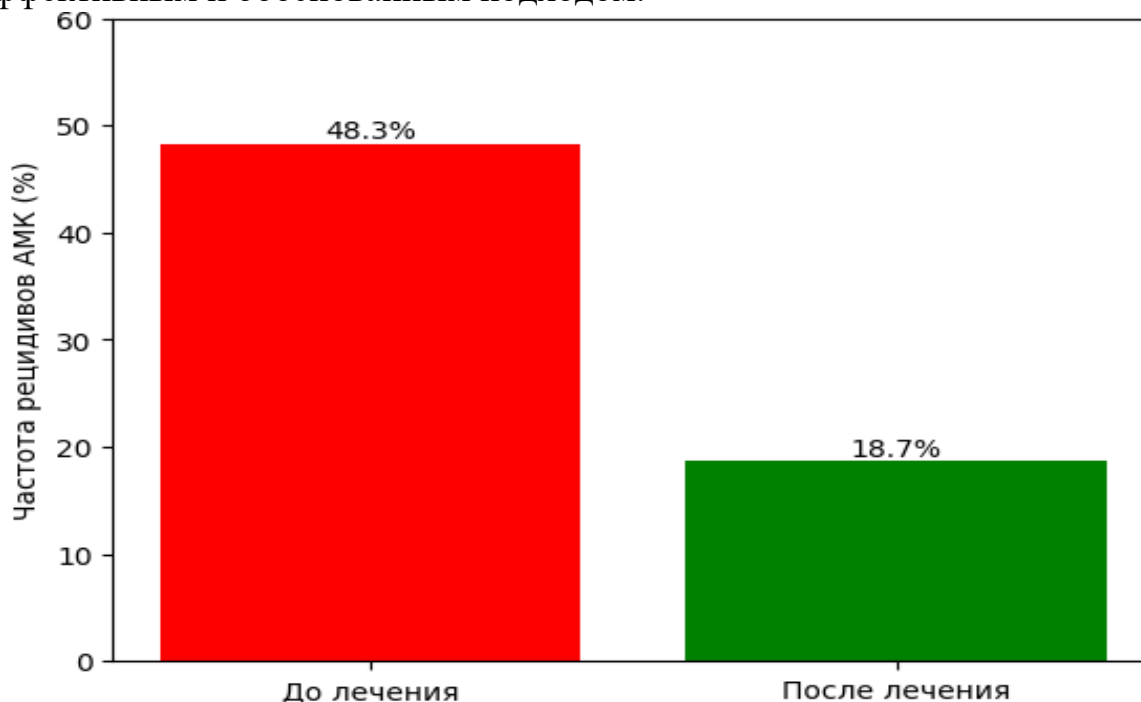


Диаграмма 1. Динамика частоты рецидивов аномальных маточных кровотечений у пациенток репродуктивного возраста (%).

Применение данного алгоритма способствует снижению частоты рецидивов, уменьшению объёма кровопотери, коррекции анемии и снижению необходимости в инвазивных вмешательствах, что в целом улучшает клинические и репродуктивные исходы.

Аномальные маточные кровотечения у женщин репродуктивного возраста характеризуются многофакторным этиопатогенезом и высокой частотой рецидивов, что подтверждает необходимость комплексного и дифференцированного подхода к диагностике и лечению.

Применение классификации PALM–COEIN в сочетании с клинико-инструментальной и лабораторной оценкой позволяет более точно определить ведущий патогенетический механизм АМК и обосновать индивидуализированную тактику ведения пациенток.

Рационализированная тактика ведения, основанная на комплексном обследовании, способствует более быстрому купированию кровотечений и достоверному снижению их длительности и интенсивности по сравнению с традиционными подходами.

Внедрение индивидуализированного алгоритма лечения приводит к значительному снижению частоты рецидивов аномальных маточных кровотечений, что подтверждается уменьшением данного показателя с 48,3% до 18,7%.

Рационализация тактики ведения пациенток с АМК позволяет существенно снизить потребность в инвазивных диагностических и лечебных вмешательствах, способствуя сохранению репродуктивной функции и уменьшению риска ятрогенных осложнений.

Полученные результаты свидетельствуют о высокой клинической эффективности предложенного подхода и целесообразности его внедрения в практическую деятельность гинекологических стационаров и амбулаторных учреждений.

Использованные источники:

1. Абрамченко В.В. Нарушения менструального цикла: клиника, диагностика, лечение. — СПб.: СпецЛит, 2019. — 288 с.
2. Андреева Е.Н., Дедов И.И. Гормональные нарушения у женщин репродуктивного возраста. — М.: ГЭОТАР-Медиа, 2020. — 320 с.
3. Гуркин Ю.А. Современная гинекология: синдромальные подходы. — Минск: Беларуская навука, 2018. — 412 с.
4. Зайдиева Я.З., Прилепская В.Н. Аномальные маточные кровотечения: клинико-диагностические аспекты. — М.: МЕДпресс-информ, 2021. — 208 с.
5. Киселёва Н.В. Эндометрий и маточные кровотечения в репродуктивном возрасте. — Новосибирск: СибАК, 2019. — 184 с.
6. Юренева С.В. Консервативное лечение гинекологических кровотечений. — М.: Практическая медицина, 2020. — 240 с.
7. Baird D.D., Dunson D.B. Bleeding disorders and abnormal uterine bleeding. — *American Journal of Obstetrics and Gynecology*, 2018. — Vol. 218(3). — P. 305–312.

8. Davis E., Sparzak P.B. Abnormal uterine bleeding: diagnosis and treatment. — *StatPearls Publishing*, 2022. — P. 1–24.
9. Higham J.M., Shaw R.W. Clinical associations with abnormal uterine bleeding. — *British Journal of Obstetrics and Gynaecology*, 2019. — Vol. 126(5). — P. 609–615.
10. Maybin J.A., Critchley H.O.D. Medical management of heavy menstrual bleeding. — *Women's Health*, 2016. — Vol. 12(1). — P. 27–34.
11. Wouk N., Helton M. Abnormal uterine bleeding in premenopausal women. — *American Family Physician*, 2019. — Vol. 99(7). — P. 435–443.

КЛИНИЧЕСКАЯ ЭФФЕКТИВНОСТЬ ПЕРСОНАЛИЗИРОВАННЫХ ПРОГРАММ ДИСПАНСЕРНОГО НАБЛЮДЕНИЯ ДЕТЕЙ РАННЕГО ВОЗРАСТА

Резюме: В статье представлена оценка клинической эффективности персонализированных программ диспансерного наблюдения детей раннего возраста. Рассмотрены преимущества индивидуализированного подхода по сравнению со стандартными схемами диспансеризации. Установлено, что персонализированные программы способствуют снижению частоты острых респираторных и соматических заболеваний, улучшению показателей физического развития и оптимизации профилактической работы врача-педиатра. Полученные результаты подтверждают целесообразность внедрения персонализированных программ диспансерного наблюдения в практику первичного звена здравоохранения.

Ключевые слова: дети раннего возраста, диспансерное наблюдение, персонализированный подход, профилактика, клиническая эффективность.

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CLINICAL EFFECTIVENESS OF PERSONALIZED DISPENSARY FOLLOW-UP PROGRAMS FOR EARLY CHILDHOOD

Resume: This article evaluates the clinical effectiveness of personalized dispensary follow-up programs for early childhood. The advantages of an individualized approach compared to standard dispensary schemes are analyzed. Personalized programs were shown to reduce the incidence of acute respiratory and somatic diseases, improve physical development indicators, and optimize preventive pediatric care. The findings support the feasibility of implementing personalized dispensary follow-up programs in primary healthcare practice.

Keywords: early childhood, dispensary follow-up, personalized approach, prevention, clinical effectiveness.

Актуальность. Ранний детский возраст является одним из наиболее критических этапов онтогенеза человека, характеризующимся интенсивным ростом, формированием жизненно важных органов и систем, а также становлением иммунной, нервной и эндокринной регуляции. В этот период закладываются основы физического, психоэмоционального и когнитивного развития ребёнка, во многом определяющие состояние здоровья в последующие возрастные периоды. В связи с этим вопросы профилактики заболеваний и рациональной организации диспансерного наблюдения детей раннего возраста занимают одно из центральных мест в современной педиатрии [3, 7].

Несмотря на значительные достижения медицинской науки, уровень заболеваемости среди детей раннего возраста остаётся высоким. Наибольший удельный вес в структуре патологии занимают острые респираторные инфекции, функциональные нарушения желудочно-кишечного тракта, анемические состояния, аллергические и атопические заболевания. Повторяющиеся эпизоды заболеваний в раннем возрасте оказывают неблагоприятное влияние на процессы роста и развития, снижают адаптационные возможности организма и способствуют формированию хронической соматической патологии [11].

Одним из ключевых инструментов профилактики и раннего выявления заболеваний у детей является система диспансерного наблюдения. Традиционно диспансеризация в педиатрии основана на стандартных, унифицированных схемах профилактических осмотров, лабораторных исследований и консультативной помощи, одинаковых для всех детей определённой возрастной группы. Данный подход доказал свою эффективность в условиях массового охвата детского населения, однако в современных условиях он всё чаще демонстрирует ограниченные возможности, связанные с недостаточным учётом индивидуальных особенностей ребёнка [1, 9].

Современные социально-экономические и экологические изменения привели к значительному росту числа детей с факторами риска нарушений здоровья. К ним относятся неблагоприятный перинатальный анамнез, преждевременные роды, внутриутробная гипоксия, искусственное вскармливание, дефицит микроэлементов, неблагоприятные жилищно-бытовые условия, а также высокая инфекционная нагрузка. Унифицированные программы диспансерного наблюдения не всегда позволяют своевременно выявлять и корректировать данные факторы, что снижает профилактическую направленность педиатрической помощи [6].

В последние годы всё большее внимание в медицине уделяется концепции персонализированного подхода, предполагающего адаптацию профилактических и лечебных мероприятий к индивидуальным особенностям пациента. В педиатрии данный подход приобретает особую значимость, поскольку детский организм отличается высокой пластичностью и чувствительностью к внешним воздействиям. Персонализированные

программы диспансерного наблюдения предусматривают стратификацию детей по уровню риска, индивидуализацию объема и частоты осмотров, а также дифференцированный подход к профилактике и коррекции выявленных нарушений [2, 12].

Актуальность внедрения персонализированных программ диспансерного наблюдения обусловлена также высокой распространённостью часто болеющих детей. Данная группа характеризуется сниженной иммунной резистентностью, частыми эпизодами острых респираторных инфекций и повышенным риском развития осложнений. Стандартные схемы диспансерного наблюдения зачастую не обеспечивают достаточного уровня профилактики у таких детей, что приводит к повторным обращениям за медицинской помощью и увеличению нагрузки на систему здравоохранения [8].

Важным аспектом проблемы является влияние ранней соматической заболеваемости на нервно-психическое развитие ребёнка. Многочисленные исследования свидетельствуют о том, что частые заболевания в раннем возрасте ассоциированы с задержкой психомоторного развития, снижением когнитивных функций и нарушением социальной адаптации. В этом контексте персонализированные программы диспансерного наблюдения могут рассматриваться как эффективный инструмент ранней профилактики не только соматических, но и психоэмоциональных нарушений [4].

Не менее значимым является экономический аспект проблемы. Повторные эпизоды заболеваний у детей раннего возраста приводят к увеличению затрат на амбулаторное и стационарное лечение, диагностические исследования и лекарственное обеспечение. Кроме того, частая заболеваемость детей негативно отражается на социально-экономическом положении семьи. Персонализированный подход к диспансерному наблюдению позволяет оптимизировать использование ресурсов здравоохранения за счёт более точной стратификации риска и рационального планирования профилактических мероприятий [10].

Современные условия цифровизации здравоохранения создают дополнительные возможности для внедрения персонализированных программ диспансерного наблюдения. Использование электронных медицинских карт, автоматизированных алгоритмов оценки риска и систем мониторинга состояния здоровья позволяет повысить точность и эффективность диспансерного наблюдения, а также улучшить преемственность между различными этапами оказания медицинской помощи [13].

Вместе с тем, несмотря на очевидные преимущества персонализированного подхода, вопросы его клинической эффективности в педиатрической практике остаются недостаточно изученными. В литературе представлены отдельные исследования, посвящённые оценке отдельных компонентов персонализированных программ, однако комплексная оценка их влияния на показатели заболеваемости, физического развития и частоты

обращений за медицинской помощью у детей раннего возраста требует дальнейшего изучения [5].

Особую актуальность приобретает необходимость разработки научно обоснованных критериев оценки эффективности персонализированных программ диспансерного наблюдения. Это связано с тем, что внедрение новых организационных моделей в систему здравоохранения должно сопровождаться доказательством их клинической и экономической целесообразности. Оценка клинической эффективности позволяет не только обосновать целесообразность внедрения персонализированных программ, но и определить направления их дальнейшего совершенствования [7].

Таким образом, актуальность исследования клинической эффективности персонализированных программ диспансерного наблюдения детей раннего возраста обусловлена высокой распространённостью заболеваний в данной возрастной группе, ограниченными возможностями стандартных схем диспансеризации, ростом числа детей с факторами риска и необходимостью оптимизации профилактической направленности педиатрической помощи. Полученные в ходе исследования данные могут послужить основой для совершенствования организации диспансерного наблюдения и повышения качества медицинской помощи детям раннего возраста [1, 6, 11].

Цель исследования. Целью настоящего исследования является оценка клинической эффективности персонализированных программ диспансерного наблюдения детей раннего возраста путём сравнительного анализа показателей заболеваемости, физического развития, частоты обращений за медицинской помощью и эффективности профилактических мероприятий по сравнению со стандартными схемами диспансерного наблюдения в условиях первичного звена здравоохранения.

Материалы и методы исследования. Исследование выполнено на базе педиатрических подразделений первичного звена здравоохранения и носило проспективный сравнительный характер. В исследование были включены дети раннего возраста от 1 месяца до 3 лет, находившиеся под диспансерным наблюдением в условиях поликлиники. Критериями включения являлись постоянное проживание в зоне обслуживания медицинского учреждения, наличие информированного согласия родителей (законных представителей) и отсутствие врождённых пороков развития и тяжёлых хронических заболеваний в стадии декомпенсации. Критериями исключения считались наличие генетических синдромов, врождённых иммунодефицитных состояний и острых инфекционных заболеваний на момент включения в исследование.

Всего обследовано ____ детей, которые были распределены на две сопоставимые группы. Основную группу составили дети, находившиеся под диспансерным наблюдением с использованием персонализированной программы, разработанной на основе индивидуальной оценки факторов риска. В контрольную группу вошли дети, наблюдавшиеся по стандартной

схеме диспансерного наблюдения, принятой в первичном звене здравоохранения. Группы были сопоставимы по полу, возрасту и основным социально-демографическим характеристикам.

Персонализированная программа диспансерного наблюдения включала комплексную оценку перинатального анамнеза, особенностей питания, условий проживания, частоты перенесённых заболеваний и наличия аллергического фона. На основании полученных данных проводилась стратификация детей по уровню риска с определением индивидуальной частоты профилактических осмотров, объёма лабораторных исследований и профилактических мероприятий. Особое внимание уделялось коррекции питания, профилактике дефицитных состояний, санации очагов хронической инфекции и обучению родителей основам профилактики заболеваний.

Результаты исследования. В ходе проведённого исследования была выполнена комплексная оценка клинической эффективности персонализированных программ диспансерного наблюдения детей раннего возраста. Анализ полученных данных показал, что внедрение индивидуализированного подхода к диспансерному наблюдению оказывает выраженное положительное влияние на показатели заболеваемости, физического развития и частоты обращений за медицинской помощью по сравнению со стандартной схемой наблюдения.

Одним из ключевых оцениваемых показателей являлась частота острых респираторных инфекций и других наиболее распространённых соматических заболеваний у детей раннего возраста. Установлено, что в основной группе, где применялась персонализированная программа диспансерного наблюдения, среднегодовая частота эпизодов острых респираторных инфекций была достоверно ниже по сравнению с контрольной группой. При этом отмечалось не только снижение общего числа эпизодов заболеваний, но и уменьшение их продолжительности и клинической выраженности.

Дети основной группы реже нуждались в повторных обращениях за медицинской помощью, что свидетельствует о более благоприятном течении заболеваний и повышении адаптационных возможностей организма. В контрольной группе, напротив, сохранялась тенденция к повторным эпизодам острых респираторных инфекций, нередко сопровождавшихся осложнённым течением и необходимостью медикаментозной коррекции.

Таблица 1.
Частота основных заболеваний у детей раннего возраста (в среднем на одного ребёнка в год).

Показатель	Основная группа	Контрольная группа
Острые респираторные инфекции	3,1 ± 0,4	5,2 ± 0,6
Функциональные нарушения ЖКТ	0,8 ± 0,2	1,6 ± 0,3
Анемические состояния	0,4 ± 0,1	1,1 ± 0,2
Аллергические проявления	0,6 ± 0,2	1,4 ± 0,3

Как видно из представленных данных, у детей, находившихся под наблюдением по персонализированной программе, частота наиболее

распространённых заболеваний была значительно ниже. Особенно выраженные различия выявлены по показателям анемических состояний и функциональных нарушений желудочно-кишечного тракта, что можно объяснить своевременной коррекцией питания и профилактикой дефицитных состояний в основной группе.

Важным направлением исследования являлась оценка физического развития детей. Анализ антропометрических показателей показал, что у большинства детей основной группы физическое развитие соответствовало возрастно-половым нормативам. Отмечалась стабильная прибавка массы тела и роста, а также меньшая вариабельность показателей по сравнению с контрольной группой. В контрольной группе чаще регистрировались отклонения от средних нормативных значений, что проявлялось как дефицитом массы тела, так и её избыточной прибавкой.

Таблица 2.

Показатели физического развития детей раннего возраста.

Показатель	Основная группа	Контрольная группа
Масса тела в пределах нормы, %	86,4	68,9
Дефицит массы тела, %	7,8	18,5
Избыточная масса тела, %	5,8	12,6
Рост в пределах возрастной нормы, %	89,2	72,4

Полученные данные свидетельствуют о том, что персонализированные программы диспансерного наблюдения способствуют более гармоничному физическому развитию детей раннего возраста. Своевременное выявление отклонений и индивидуальная коррекция профилактических мероприятий позволяют предотвратить формирование стойких нарушений роста и массы тела.

Отдельного внимания заслуживает анализ частоты обращений за медицинской помощью и потребности в медикаментозной терапии. Установлено, что в основной группе число обращений к врачу-педиатру по поводу острых заболеваний было существенно ниже. Кроме того, отмечалось сокращение частоты назначения антибактериальных препаратов, что является важным показателем рационализации медицинской помощи и профилактики антибиотикорезистентности.

Таблица 3.

Частота обращений за медицинской помощью и медикаментозной терапии.

Показатель	Основная группа	Контрольная группа
Обращения к педиатру (в год)	4,3 ± 0,5	7,1 ± 0,7
Назначение антибиотиков, % детей	18,6	37,9
Повторные обращения по одному эпизоду заболевания, %	12,4	29,8

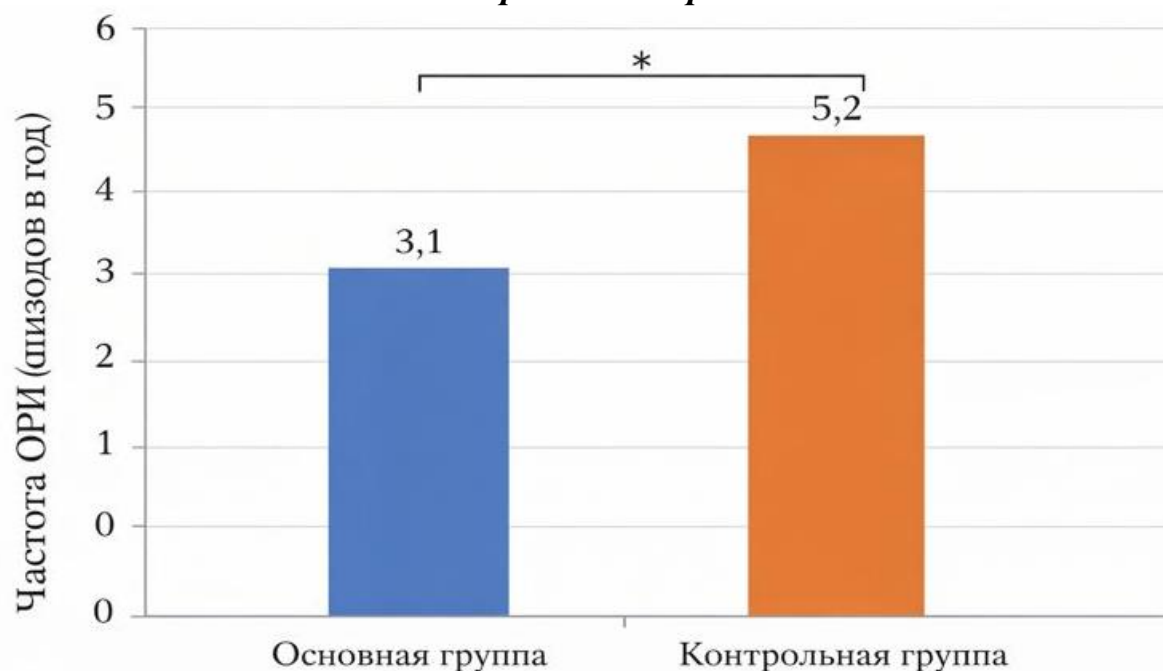
Снижение частоты обращений и медикаментозных вмешательств в основной группе свидетельствует о повышении эффективности профилактических мероприятий и улучшении общего состояния здоровья детей. Родители детей, наблюдавшихся по персонализированной программе, отмечали улучшение самочувствия ребёнка, повышение уровня физической активности и снижение тревожности, связанной с частыми заболеваниями.

Дополнительно в ходе исследования была отмечена положительная динамика в формировании приверженности родителей к выполнению профилактических рекомендаций. Индивидуализированный подход, включавший разъяснительную и образовательную работу, способствовал более ответственному отношению семьи к вопросам питания, режима дня и профилактики инфекционных заболеваний. Это, в свою очередь, усиливало эффект проводимых мероприятий и способствовало устойчивому снижению заболеваемости.

Для наглядной оценки клинической эффективности персонализированных программ диспансерного наблюдения была проведена сравнительная характеристика частоты острых респираторных инфекций у детей раннего возраста в основной и контрольной группах. Полученные данные представлены в виде диаграммы, что позволяет визуализировать различия между группами и объективно оценить влияние индивидуализированного подхода к диспансерному наблюдению на уровень заболеваемости.

Диаграмма 1.

Сравнительная динамика частоты острых респираторных инфекций у детей раннего возраста



Персонализированные программы диспансерного наблюдения обеспечивают достоверное снижение частоты острых респираторных

инфекций у детей раннего возраста по сравнению со стандартной схемой наблюдения, что подтверждает их клиническую эффективность и профилактическую направленность.

Вывод. Таким образом, результаты исследования убедительно демонстрируют, что персонализированные программы диспансерного наблюдения детей раннего возраста обладают высокой клинической эффективностью. Их применение приводит к снижению частоты заболеваний, улучшению показателей физического развития, сокращению числа обращений за медицинской помощью и рационализации медикаментозной терапии. Полученные данные подтверждают целесообразность широкого внедрения персонализированных программ диспансерного наблюдения в практику первичного звена здравоохранения.

Использованные источники:

1. Баранов А.А. Педиатрия: национальное руководство. – М.: ГЭОТАР-Медиа, 2021. – 1024 с.
2. Баранов А.А., Альбицкий В.Ю. Профилактическая направленность современной педиатрии // Вопросы современной педиатрии. – 2019. – Т. 18, № 2. – С. 5–10.
3. Зайцева О.В., Таточенко В.К. Острые респираторные инфекции у детей: диагностика и профилактика. – М.: ГЭОТАР-Медиа, 2022. – 256 с.
4. Иванов Д.О., Намазова-Баранова Л.С. Диспансерное наблюдение детей раннего возраста: современные подходы. – СПб.: СпецЛит, 2019. – 312 с.
5. Ковалева Л.А., Румянцев А.Г. Часто болеющие дети: клинико-профилактические аспекты // Педиатрия. – 2018. – Т. 97, № 6. – С. 120–126.
6. Кучма В.Р., Сухарева Л.М. Гигиена детей и подростков. – М.: ГЭОТАР-Медиа, 2020. – 560 с.
7. Намазова-Баранова Л.С., Куличенко Т.В. Персонализированная медицина в педиатрии: возможности и перспективы // Педиатрия. Журнал им. Г.Н. Сперанского. – 2021. – Т. 100, № 3. – С. 7–15.
8. Смирнова Е.А., Федорова О.В. Оценка факторов риска заболеваемости у детей раннего возраста // Российский педиатрический журнал. – 2020. – № 4. – С. 25–30.
9. Стародубов В.И., Улумбекова Г.Э. Первичная медико-санитарная помощь детям: современные организационные модели // Менеджмент здравоохранения. – 2021. – № 6. – С. 12–18.
10. Федоренко М.В., Иванова Н.А. Организация диспансерного наблюдения детей в условиях первичного звена здравоохранения // Здравоохранение Российской Федерации. – 2019. – № 5. – С. 41–45.
11. Шабалов Н.П. Детские болезни: учебник для медицинских вузов. – М.: ГЭОТАР-Медиа, 2020. – Т. 1. – 880 с.
12. UNICEF. Early childhood development: health and well-being. – New York: UNICEF, 2020. – 96 p.
13. World Health Organization. WHO guideline on integrated management of childhood illness. – Geneva: WHO, 2021. – 178 p.

ИСКУССТВО ЗАЩИТЫ: ПОЛНОЕ РУКОВОДСТВО ПО УХОДУ ЗА КОЖЕЙ В ЗИМНИЙ ПЕРИОД

Аннотация: В статье представлен комплексный анализ влияния низкотемпературных климатических факторов на морфофункциональное состояние кожных покровов. Обоснованы современные патофизиологические механизмы развития сезонного ксероза, ассоциированного со снижением биосинтеза эпидермальных липидов и интенсификацией трансэпидермальной потери влаги. Рассмотрены принципы рациональной дерматологической коррекции с использованием концепции сочетанного применения хумектантов и окклюзивов. Особое внимание уделено роли фотопротекции в условиях повышенного альбедо снежного покрова и возможностям аппаратных косметологических методов в восстановительный период. Сделан вывод о необходимости дифференцированного подхода к выбору средств наружной терапии с учетом барьерной функции кожи и сопутствующих дерматологических статусов.

Ключевые слова: зимний ксероз; эпидермальный барьер; трансэпидермальная потеря влаги; церамиды; хумектанты; окклюзивы; дерматокосметология; фотопротекция.

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CLINICAL AND PATHOPHYSIOLOGICAL ASPECTS OF WINTER XEROSIS: MODERN APPROACHES TO THERAPEUTIC CORRECTION AND PREVENTION

Abstract: The article provides a comprehensive analysis of the influence of low-temperature climatic factors on the morphofunctional state of the skin. Modern pathophysiological mechanisms of seasonal xerosis development associated with a decrease in the biosynthesis of epidermal lipids and intensification of transepidermal water loss are substantiated. The principles of rational

dermatological correction using the concept of combined use of humectants and occlusives are considered. Particular attention is paid to the role of photoprotection in conditions of increased albedo of the snow cover and the possibilities of hardware cosmetology methods during the recovery period. It is concluded that a differentiated approach to the choice of external therapy agents is necessary, taking into account the barrier function of the skin and concomitant dermatological statuses.

Keywords: winter xerosis; epidermal barrier; transepidermal water loss; ceramides; humectants; occlusives; dermatocosmetology; photoprotection.

Введение

Сезонные изменения климата оказывают существенное влияние на гомеостаз кожных покровов. Сочетание низких температур, ветра и низкой относительной влажности в отапливаемых помещениях создает условия для развития так называемого «климатического стресса», приводящего к нарушению защитных свойств эпидермиса [1, 2]. Клинически данные изменения проявляются субъективными ощущениями стянутости, гиперемией и выраженным шелушением, что при отсутствии адекватной коррекции может трансформироваться в хронические дерматологические патологии [3].

Патофизиология зимнего ксероза

Основным звеном патогенеза зимнего ксероза является резкое угнетение синтеза поверхностных липидов. При снижении температуры окружающей среды секреторная активность сальных желез замедляется, что ведет к изменению реологических свойств себума и истончению гидролипидной мантии [3].

Вторым критическим фактором выступает трансэпидермальная потеря влаги (ТЭПВ). В условиях помещений с центральным отоплением влажность воздуха часто не превышает 15–20%. Градиент концентрации влаги между глубокими слоями кожи и сухой внешней средой провоцирует ускоренную диффузию воды через роговой слой, что при повреждении межклеточного матрикса ведет к дегидратации кератиноцитов [4, 5].

Материалы и методы: стратегия наружной терапии

Рациональный подход к зимнему уходу требует пересмотра этапности и состава применяемых средств.

1. Оптимизация этапа очищения. Использование агрессивных поверхностно-активных веществ (ПАВ), в частности натрия лаурилсульфата (SLS), в зимний период недопустимо, так как они способствуют элюции межклеточного липидного цемента [6, 7]. Предпочтение следует отдавать безмыльным очищающим средствам (синдетам), кремовым эмульсиям и гидрофильным маслам, поддерживающим физиологический pH [8].

2. Концепция комбинированного увлажнения.

Эффективная коррекция дефицита влаги базируется на синергии двух групп компонентов:

Хумектанты (низкомолекулярная гиалуроновая кислота, глицерин, мочеви́на) — обеспечивают привлечение влаги. Однако в условиях критически низкой влажности воздуха они могут провоцировать дефицит влаги в дерме, если не дополнены окклюзивами [10].

Окклюзивы и липидовосполняющие агенты (церамиды 1, 3, 6-II типа, сквалан, масло карите, холестерин). Эти компоненты имитируют физиологический барьер и встраиваются в поврежденные участки рогового слоя, предотвращая ТЭПВ [11].

Результаты и обсуждение: выбор средств и процедур

Клинический опыт подтверждает эффективность средств специализированной дерматокосметики, направленной на восстановление барьерной функции (линии на основе ниацинамида и физиологических липидов). Исследования показывают, что использование топических средств с церамидами снижает интенсивность зуда и воспаления при холодовой аллергии [11].

Фотопротекция.

Несмотря на низкий индекс инсоляции, зимний период характеризуется высоким уровнем отраженной радиации (до 80% от снежного покрова). Применение фильтров SPF 30+ является обязательным условием профилактики фотостарения, особенно на фоне использования ретиноидов или эксфолиантов [6].

Косметологические манипуляции.

Зимний сезон является оптимальным периодом для проведения процедур, требующих длительной реабилитации:

Химические пилинги (поверхностно-срединные) для коррекции гиперкератоза [3].

Биоревитализация и мезотерапия для создания гидродепо в дермальном слое.

Лазерная шлифовка, характеризующаяся минимальным риском поствоспалительной гиперпигментации в данное время года.

Заключение

Эффективная защита кожи в зимний период требует интегративного подхода, сочетающего топическую терапию (липидовосполнение), аппаратную поддержку и нутрициологическую коррекцию (Омега-3, витамины D и C) [4]. Научно обоснованный выбор средств, учитывающий баланс между гидратацией и окклюзией, позволяет минимизировать риски развития сезонного ксероза и сохранить функциональную целостность кожного барьера.

Использованные источники:

1. Draelos, Z. D. (2015). Cosmeceuticals. Elsevier Health Sciences.
2. Healthline Media. (2023). Everything You Need to Know About Ceramides.
3. Journal of Clinical and Aesthetic Dermatology. (2016). The Role of Skin Care and In-Office Procedures in Enhancing Skin Health. Vol. 9(5).

4. PubMed Central (PMC). (2014). Cosmetic and Therapeutic Applications of Fish Oil's Fatty Acids on the Skin.
5. American Academy of Dermatology (AAD). (2024). Dermatologists' tips for relieving dry skin.
6. Skin Cancer Foundation. (2023). Winter Sun Hazards: Why You Need Sunscreen in Cold Weather.
7. Harvard Health Publishing. (2021). 6 tips for seasonal skin care. Harvard Medical School.
8. Rawlings, A. V., & Lombard, K. J. (2012). A review on the extensive skin benefits of mineral oil. *International Journal of Cosmetic Science*.
9. Kholikjon, S., & Javohir, K. (2025). THE STATE OF PRACTICE OF TEACHING THE SUBJECT "MEDICAL BIOLOGY. GENERAL GENETICS" IN HIGHER MEDICAL EDUCATION INSTITUTIONS. *Web of Medicine: Journal of Medicine, Practice and Nursing*, 3(3), 611-613.
10. Ташкенбаева, У. А., Сафаров, Х. Х., & Тохтаев, Г. Ш. (2025). ОПТИМИЗАЦИЯ ЛЕЧЕНИЯ БОЛЬНЫХ КРАСНЫМ ПЛОСКИМ ЛИШАЕМ. *Экономика и социум*, (10-2 (137)), 1165-1170.
11. Ташкенбаева, У. А., & Сафаров, Х. Х. (2025). ОПТИМИЗАЦИЯ ЛЕЧЕНИЯ И ПРОФИЛАКТИКА КРАСНОГО ПЛОСКОГО ЛИШАЯ (АКЦЕНТ НА МИКРОБИОЛОГИЧЕСКИЕ АСПЕКТЫ). *Universum: химия и биология*, 1(6 (132)), 27-30.

THE IMPACT OF THE INTERNATIONAL PISA ASSESSMENT PROGRAM ON THE NATIONAL EDUCATION SYSTEM

Abstract. *The article examines the essence of international studies aimed at evaluating the quality of education, conducted by the Organization for Economic Co-operation and Development (OECD). It provides a detailed analysis of the main goals and objectives of the PISA program, as well as the age and academic groups of students included in the assessment. Special attention is given to the influence of PISA results on national educational policy, their role in improving the school education system, and the practical significance of the program for the modernization of the educational process.*

Key words: *PISA international educational assessment program, students' functional literacy, general secondary schools, educational policy, competencies.*

Global changes and the rapidly developing information and communication technologies have made the quality of education one of the key factors of national progress. Therefore, improving the system for assessing education quality at all levels, aligning it with international standards, and ensuring an objective evaluation of students' knowledge and skills has become an urgent priority. Participation in international comparative programs such as PISA, TIMSS, and PIRLS provides significant strategic opportunities for the development of the national education system. These programs allow not only the assessment of students' competencies but also a deep analysis of education policy, educational standards, curricula, and the effectiveness of pedagogical methods.

International assessment programs are based on many years of scientific and methodological research. They evaluate not only students' theoretical knowledge but also their ability to apply knowledge in real-life situations, solve problems, think creatively and logically, analyze information, and draw conclusions. From this perspective, Uzbekistan's participation in these programs helps to objectively identify the strengths and weaknesses of the education system and determine clear directions for future reforms.

Uzbekistan's Steps Toward Participation in International Education Quality Assessment Programs. The Presidential Decree adopted on April 29, 2019, defined the strategic directions for developing the national education system until 2030. One of the key goals outlined in the decree was for Uzbekistan to enter

the top 30 countries in the PISA international ranking. Achieving this objective requires fundamental reforms in various areas, including the content of education, pedagogical methodologies, assessment systems, teacher training, the quality of learning materials, and the organization of the educational process.

One of the most important issues emphasized in the Concept is the modernization of textbooks, pedagogical methods, and curricula in accordance with contemporary requirements. This includes developing students' critical and creative thinking, fostering their ability to independently search for and analyze information, and strengthening their communication and problem-solving competencies. Accordingly, the national education standards are also being revised on the basis of a competency-based approach.

Challenges in the National Education System and Directions for Their Improvement. The Concept identifies several problems within the education sector openly and objectively, including:

- outdated content of textbooks on pedagogy and teaching methodology;
- the existence of a monopolistic system in the development of textbooks;
- the dominance of memorization-based teaching methods in the learning process;
- insufficient use of strategies that develop critical thinking;
- low level of teacher preparedness in modern pedagogical methodologies;
- the need to optimize curriculum volume and the number of academic subjects.

The presence of these issues increases the likelihood of low results in international programs such as PISA. Therefore, the Concept outlines specific tasks to address these challenges, including strengthening interdisciplinary integration, optimizing curricula, individualizing the learning process, ensuring continuous professional development of teachers, and creating innovative teaching programs and resources.

Preparatory Measures for Participation in International Programs

More than 200 tasks aligned with PISA and PIRLS requirements were translated and reviewed through international linguistic expertise — marking one of the first significant steps for the country. In addition, the following resources were developed and distributed to all schools:

- 20 video lessons and instructional videos,
- 7 methodological guides,
- methodological packages for PISA, PIRLS, and TIMSS.

These efforts have contributed to building a reliable methodological foundation for teachers.

The Strategic Importance of Participating in PISA

Uzbekistan's participation in the PISA program is expected to provide the following major opportunities:

- obtaining an objective and nationally relevant assessment of the quality of education;
- planning educational reforms based on evidence;
- creating a scientific foundation for the modernization of curricula;

- introducing innovative methodologies that foster critical and creative thinking;
- training teachers in accordance with international standards;
- increasing the competitiveness of the national education system.

The Need to Update Curricula and Textbooks

Since the methodology of PISA focuses on assessing students' competencies in applying knowledge to real-life situations, it is necessary to introduce the following changes into the national curriculum:

- increasing the number of tasks based on real-life problems;
- strengthening interdisciplinary integration and project-based activities;
- expanding exercises aimed at developing reading literacy and working with texts;
- widely implementing STEM/STEAM approaches;
- making practice-oriented tasks an integral part of every subject curriculum.

Conclusion. Participation in international assessment programs is of strategic importance for Uzbekistan—not only as an opportunity to achieve higher rankings, but also as a key factor in building an education system aligned with the demands of a modern innovative economy. Integrating the PISA model into the national education system, updating curricula, improving teacher qualifications, enhancing methodological resources, and raising students' literacy levels all contribute to improving the quality of the country's human capital.

References

1. Lebedev, S. *The Problem of Truth in Natural Science and Social-Humanitarian Sciences*. In: *Philosophy of Social and Humanitarian Sciences: Textbook for Universities*. Moscow: Academic Project, 2006. p.11.
2. Sultonova, G. *Problems of Ideological Inheritance and Innovations in the Form of Post-Nonclassical Scientific Thinking*. PhD Dissertation Abstract in Philosophy. Samarkand, 2018. p.7.
3. Nazarov, K. *Philosophy of Cognition*. Tashkent: University, 2005. p.219.
4. Hessen, S. I. *Foundations of Pedagogy: Introduction to Applied Philosophy*. Ed. P. V. Alekseev. Moscow: "Shkola-Press", 1995. p.448.
5. Saytkosimov, A. *Laws of Innovative Development of the Social Sphere in the Construction of Civil Society*. Tashkent: Tafakkur, 2019. p.135.
6. Mirziyev, Sh. *School Education Must Become a Nationwide Movement*. Available at: <http://uza.uz/oz/politics/maktab-talimini-rivozhlantirish-umumkhal-arakatiga-aylanishi-23-08-2019>
7. Mahmudkhoja Behbudi. *Educational Reform*. In: *Selected Works. Vol. I*. Tashkent: Akademnashr, 2018. p.289.
8. Karimov, I. *A Call for Awareness: Answers to the Questions of the National Information Agency Correspondent*. In: *Free and Prosperous Homeland, Our Ultimate Goal*. Vol. 8. Tashkent: Uzbekistan, 2000. p.30.
9. Xolbekov, A.A. *Assessing Education Quality and International Rating Systems*. Tashkent: Fan va Texnologiya, 2021.

10. Turdaliyeva, G.Sh. *Methodology for Improving Assessment Systems in Modern Education*. Tashkent, 2020.

В СТАТЬЕ ДВЕ АННОТАЦИИ НА АНГЛ

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**ҚАНДЛИ ДИАБЕТ 1-ТУРИ ФОНИДА РИВОЖЛАНГАН ЎТКИР
ЙИРИНГЛИ ЎРТА ОТИТНИНГ КЛИНИК ХУСУСИЯТЛАРИ ВА
ЛАБОРАТОР ВА ИНСТРУМЕНТАЛ КЎРСАТКИЧЛАРИ БАХОЛАШ**

Аннотация. Ўтказилган текширув асосида ЎЙЎОнинг клиник кўринишларининг қуйидаги хусусиятлари аниқланган. Шундай қилиб, қандли диабет фонида ривожланган ўткир йирингли ўрта отитда бемор бола қулоғидан тўсатдан йиринг оқиши (77,5%), қулоқ оғриғи ва қулоқ тиқилиши ёки эшитиш қобилиятининг пасайиши (82,5%), шунингдек иситма ва бош оғриғи (52,5% ва 67,5%) шикоятлари кузатилган.

Калит сўзлар: ўрта отит, қандли диабет, болалар, иммунология, оториноларингология.

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**CLINICAL FEATURES AND ASSESSMENT OF LABORATORY
AND INSTRUMENTAL PARAMETERS OF ACUTE PURULENT OTITIS
MEDIA DEVELOPED AGAINST THE BACKGROUND OF TYPE 1
DIABETES MELLITUS**

Abstract. Based on the conducted examination, the following features of the clinical manifestations of acute purulent otitis media were identified. Thus, in acute purulent otitis media developed against the background of diabetes mellitus, the patient's child complained of sudden discharge of pus from the ear (77.5%), earache and ear congestion or decreased hearing (82.5%), as well as fever and headache (52.5% and 67.5%).

Keywords: *otitis media, diabetes mellitus, children, immunology, otorhinolaryngology.*

Introduction

Despite the significant role of microbial and other factors in the development of acute otitis media (AOM) in newborns and infants, the condition of the macroorganism and its overall immunological reactivity is of decisive importance. The study of the immune status of children suffering from infectious diseases undoubtedly represents considerable theoretical and practical interest. By the time of birth, a child possesses a complex of specific and non-specific defense factors [20; pp. 67–68; 52; pp. 24–30].

The maturation of the immune system in children occurs over a wide individual time range. The dynamics of immunoglobulin levels during the first year of life are characterized by well-established evidence, indicating that their levels reach only 35–38% of adult values. At the same time, disturbances in the ratio of individual immunoglobulin classes are observed, as well as qualitative changes of varying degrees in their composition. Alterations in the immunological status of children have a significant impact on the clinical manifestations of acute otitis media.

The following laboratory and instrumental examinations were performed in the patients: complete blood count, audiometric assessment of hearing acuity, radiographic examination of the mastoid air cells, as well as bacteriological analysis of purulent ear discharge and determination of antibiotic sensitivity.

Analysis of blood parameters in the examined patients showed that in cases of acute purulent otitis media developing against the background of diabetes mellitus, peripheral blood levels of hemoglobin, erythrocytes, and monocytes were significantly reduced ($P < 0.05$), while leukocytes, neutrophils, eosinophils, and erythrocyte sedimentation rate (ESR) were significantly increased compared with normal values ($P < 0.05$) (Table 3.3).

In acute purulent otitis media developing against the background of diabetes mellitus, signs of inflammation and intoxication were more pronounced: leukocytosis ranged from $10 \times 10^9/\text{L}$ to $13 \times 10^9/\text{L}$; in 23 patients (57.5%) it reached $14 \times 10^9/\text{L}$, and in 7 patients (17.5%) exceeded this level. In some cases, ESR was accelerated to 20 mm/hour, and the percentage of neutrophils exceeded age-related reference values by approximately 20%.

Hemoglobin (89.9 g/L), erythrocytes ($2.96 \times 10^{12}/\text{L}$), lymphocytes (23.55%), and monocytes (2.55%) in children with acute purulent otitis media (APOM) on the background of diabetes mellitus were lower compared with children with APOM without diabetes and significantly lower than age-matched healthy children. The proportion of eosinophils in peripheral blood was of particular interest, as it is one of the markers of allergic inflammation. In children with APOM and diabetes mellitus, the average eosinophil levels in peripheral blood were nearly twice as high as in children with APOM without diabetes.

Table**3.2***Peripheral blood parameters of examined children*

Parameter	APOM with Diabetes Mellitus (n=40)	APOM without Diabetes Mellitus (n=10)
Hemoglobin, g/L	89.94 ± 2.03*	95.54 ± 2.05
Erythrocytes, 10 ¹² /L	2.96 ± 0.07*	3.25 ± 0.07
Leukocytes, 10 ⁹ /L	12.10 ± 0.23*	10.41 ± 0.26
Lymphocytes, %	23.55 ± 2.46*	20.51 ± 2.15
Segmented neutrophils, %	69.35 ± 2.46*	60.51 ± 2.15
Monocytes, %	2.55 ± 0.226*	4.51 ± 0.215
Eosinophils, %	4.15 ± 0.246*	2.51 ± 0.215
ESR, mm/h	9.72 ± 0.603*	8.79 ± 1.07

Note: * indicates a statistically significant difference compared with the control group, $P < 0.05$; the differences between APOM with diabetes mellitus and APOM without diabetes mellitus were also statistically significant.

Hearing impairment data in the examined patients are presented in **Table 3.3**.

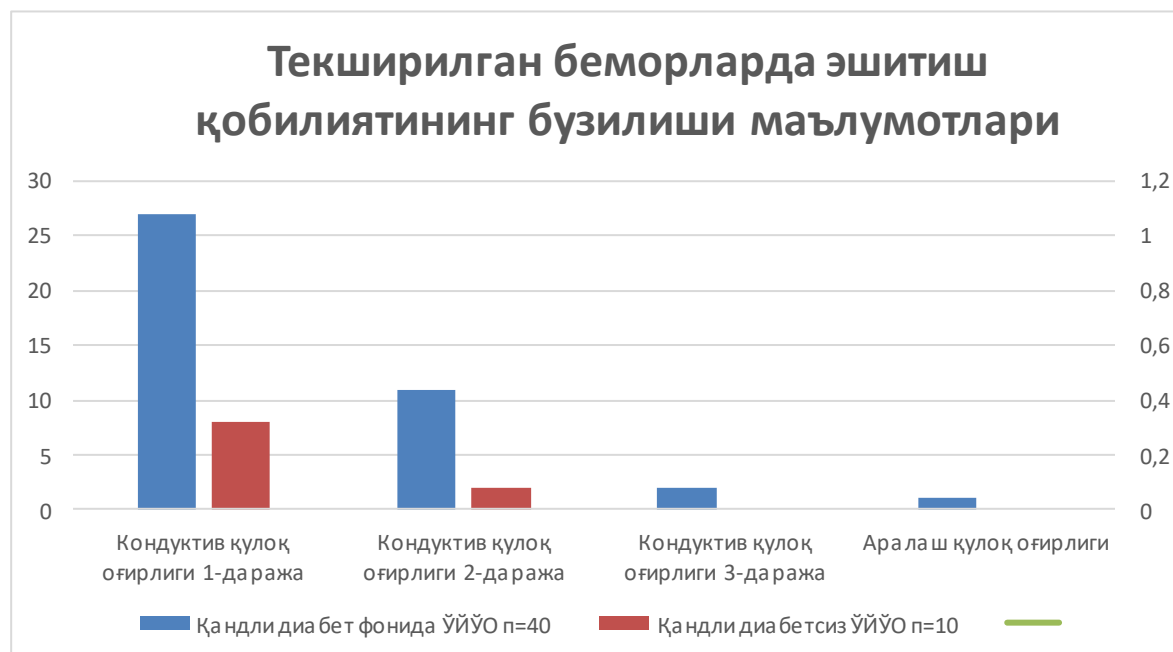
Table**3.3***Hearing impairment in examined patients*

Type of Hearing Loss	APOM with Diabetes Mellitus (n=40)	APOM without Diabetes Mellitus (n=10)
Conductive Hearing Loss, Grade 1	27 (67.5%)	8 (80.0%)
Conductive Hearing Loss, Grade 2	11 (27.5%)	2 (20.0%)
Conductive Hearing Loss, Grade 3	2 (5.0%)	—
Mixed Hearing Loss	1 (2.5%)	—

Note: Numerator indicates the number of patients; denominator (percentage) indicates the proportion of patients within the group.

The analysis of hearing impairment among the examined patients revealed distinct differences between children with acute purulent otitis media (APOM) with and without diabetes mellitus. In the group of children with diabetes mellitus (n=40), 27 patients exhibited Grade 1 conductive hearing loss, 11 patients had Grade 2, and 2 patients showed Grade 3 conductive hearing loss. Additionally, one patient presented with mixed hearing loss. In contrast, in the group without diabetes mellitus (n=10), 8 children had Grade 1 conductive hearing loss and 2 children had Grade 2 conductive hearing loss, with no cases of Grade 3 or mixed hearing loss detected. These findings indicate a higher prevalence and severity of hearing

impairment in children with APOM complicated by diabetes mellitus compared to those without diabetes.



In patients with chronic otitis media (COM) developing against the background of diabetes mellitus, hearing loss was detected at grade I in 67.5% and grade II in 27.5% of cases, while only 2 patients (5%) exhibited grade III hearing loss. COM developing against the background of diabetes mellitus was identified in 2.5% of pediatric patients. In COM without diabetes mellitus, no sensorineural type of hearing loss was detected.

In the speech frequency range in patients with diabetes-related COM, the mean air conduction hearing threshold was 20–40 dB in 25 patients (62.5%), 40–60 dB in 14 patients (35%), and 60–80 dB in 1 patient (2.5%). In 37 patients (92.5%), bone conduction thresholds in the normal frequency range remained within normal limits; in 2 patients (5%), it increased by 10 dB, and in 1 patient (2.5%), it increased by 20 dB. Air conduction patterns were horizontal in 28 patients (70%), rising in 11 patients (27.5%), and falling in 1 patient (2.5%).

These clinical features are important for indirectly assessing the presence of anaerobic microflora and timely adjusting treatment with anaerobic-targeted drugs. Purulent ear discharge in 20 patients (25%) contained a bacterial-fungal microbial association. During examination, in patients with a bacterial-fungal association, the discharge appeared dirty green or dirty gray with a fetid odor. Their clinical presentation was characterized by persistent otorrhea, labyrinthine symptoms, headache, ear pain, general intoxication signs, and poor responsiveness to conservative therapy.

While in COM without diabetes, the clinical manifestations of fungal-bacterial flora associations correspond to literature data, in diabetes-related COM, the occurrence of fungal flora has not been documented in available literature.

Overall, the obtained results indicate that COM developing against the background of diabetes mellitus has specific clinical progression and clinic-laboratory characteristics, which differ significantly from COM without diabetes and are characterized by less pronounced signs of middle ear inflammation.

Conflict of Interest

The authors declare that this study, its topic, subject, and content did not influence any competing interests.

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Data Availability

All data obtained or analyzed during this study are included in this published article.

Authors' Contributions

All authors contributed to the preparation of the study and the interpretation of its results, as well as to the manuscript preparation. All authors have read and approved the final version of the manuscript.

Ethical Approval and Consent to Participate

All international, national, and/or institutional guidelines for the care and use of animals were followed.

Consent for Publication

Not applicable.

References

1. Voxidov N. Kh. Interpretation of leukogram in acute purulent otitis media in infants. *Vestnik Otorinolaringologii*. Moscow, 2002; №6: 48–49.
2. Voxidov N. Kh. Features of the distribution of acute otitis media in children depending on the season. *Vrach Obshchey Praktiki*. Samarkand, 1999; №2: 67–68.
3. Voxidov N. Kh. Features of the functional state of erythrocyte system indicators in the clinic of acute otitis media in young children. *Vestnik Vracha Obshchey Praktiki*. Samarkand, 1999; №4: 15–16.
4. Voxidov N. Kh. Varieties of microflora in the clinic of purulent otitis media in children. *Vestnik Vracha Obshchey Praktiki*. Samarkand, 1999; №3: 21–22.
5. Vyalkova A. A., Saveleva E. V., Kulagina E. P. Diseases of the urinary organs in children with type 1 diabetes mellitus in Orenburg Region. *Paediatric i Rossiysky Vestnik Perinatologii*. Moscow, 2015; 60(4): 201.
6. Garashenko T. I., Bogomilsky M. R., Radsig E. Yu. Use of mucolytic drugs in diseases of the upper respiratory tract and middle ear. *Materials of the Russian Scientific-Practical Conference, 19–20 November 2002*. Moscow, 2002: 37–38.
7. Grigorev K. I., Grigoryan A. K., Zaprudnov A. M. Otipaks in the treatment of acute otitis media in children. *Paediatric i Rossiysky Vestnik Perinatologii*. Moscow, 2000; №2: 45–48.
8. Daminov T. A., Tuychiev L. N., Tadjieva N. U., Khamraeva V. Sh. Role of infection in the development of acute purulent otitis media in children. *Meditsinsky Magazine Uzbekistan*. Tashkent, 2015; №2: 81–84.

9. Narzullaev N. U., Kurbanov M. K. Clinical and immunological features of acute otitis media in children with type 1 diabetes mellitus. *Journal of Advanced Zoology*. 2023; 44: 282–286.
10. Dreval A. V., Rimarchuk G. V., Loseva V. A., Redkin Yu. A. Prevalence of diabetes mellitus in children and adolescents in the Moscow region. *Problems of Endocrinology*, 2007; №2: 3–5.
11. Enin I. V., Enin I. P., Karpov V. P. Prevention of persistent hearing loss in patients with acute otitis media. *Bulletin of Otorhinolaryngology*, Moscow, 2007; №1: 26–28.
12. Kurbanov M. K. Immunological properties of acute otitis media in children with type 1 diabetes. *A New Day in Medicine*, 2024; №7 (69): 2181–2187.
13. Kurbanov M. K. Development of type 1 diabetes against the background of progressive otitis media with clinical manifestations and laboratory-instrumental studies. *Tibet by Yangi Kun*, Bucharest, 2025; №1 (75): 513–516.
14. Nurov U. I., Kurbanov M. K. Biological, soil, and immunological studies in otitis media. *Eurasian Journal of Otorhinolaryngology-Surgery of the Head and Neck*. Bucharest, 2024; №3(3): 51–55.
15. Nurov U. I., Kurbanov M. K. Diabetes mellitus in children and its role in the development of otitis media. *Eurasian Journal of Otorhinolaryngology-Head and Neck Surgery*. Bucharest, 2024; №3(3): 56–60.
16. Kurbanov M. K. Clinic of acute otitis in children on the background of type 1 diabetes. *European Journal of Modern Medicine and Practice*. 2023; 2(12): 255–257.
17. Narzullaev N. U., Kurbanov M. K. Clinical course of acute otitis media in children with type 1 diabetes mellitus. *Eurasian Research Bulletin*. 2023; 18: 136–138.
18. Narzullaev N. U., Kurbanov M. K. Clinical course of acute otitis media in children with type 1 diabetes mellitus. *Eurasian Research Bulletin*. 2023; 18: 112–114.
19. Kurbanov M. K. Immunological properties of acute otitis in children with type 1 diabetes. *Research Journal of Trauma and Disability Studies*. 2024; 945–950.
20. Kurbanov M. K. Acute suppuration developed on the background of diabetes mellitus in children: study of immune system indicators in otitis media. *Journal of Science in Medicine and Life*. 2024; 5–7.
21. Kurbanov M. K. Immune system changes in acute secondary purulent otitis in children developing against the background of diabetes mellitus. *Scientific Journal of Applied and Medical Sciences*. 2024; №2: 109–111.

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CLINICAL COURSE CHARACTERISTICS AND PREDICTION OF COMPLICATIONS IN NEONATAL INFECTIONS

Abstract: Neonatal infections remain a major cause of morbidity and mortality worldwide due to the physiological immaturity of newborns and the non-specific nature of early clinical signs. Rapid progression of infection in this age group is associated with an underdeveloped immune response, limited inflammatory reactivity, and a high risk of systemic dissemination. Early identification of neonates at risk for severe disease is essential for timely therapeutic intervention and improved outcomes.

This analytical review summarizes current scientific data on the clinical course of neonatal infections and identifies key clinical and laboratory predictors of severe complications. Particular attention is given to early warning signs such as feeding intolerance, lethargy, respiratory instability, and temperature dysregulation. Laboratory markers including C-reactive protein, procalcitonin, leukocyte abnormalities, thrombocytopenia, metabolic acidosis, and elevated lactate levels are discussed in terms of their prognostic value.

Perinatal risk factors such as prematurity, low birth weight, prolonged rupture of membranes, maternal infection, and the need for invasive procedures significantly increase the likelihood of systemic infection and multi-organ dysfunction. The article proposes an integrated predictive approach based on the combined assessment of clinical signs, laboratory biomarkers, and perinatal history. Such a strategy may improve early diagnosis, optimize intensive care decisions, and reduce neonatal mortality. Further clinical studies are required to validate the proposed predictive model in practical settings.

Keywords: neonatal infection, neonatal sepsis, prediction, complications, biomarkers, prematurity, risk factors

Introduction

The neonatal period, defined as the first 28 days of life, represents one of the most vulnerable stages in human development. During this time, physiological systems, particularly the immune system, are functionally immature, making newborns highly susceptible to infectious diseases. Neonatal infections remain a leading cause of morbidity and mortality worldwide, especially in low- and middle-income countries.

According to the World Health Organization, infectious diseases account for a significant proportion of neonatal deaths globally. Neonatal sepsis, pneumonia, and meningitis are among the most severe conditions, frequently leading to long-term neurological impairment or death. Despite advances in perinatal and neonatal care, early diagnosis and risk stratification of neonatal infections remain challenging due to the non-specific nature of clinical manifestations.

Neonatal infections are generally classified into:

- **Early-onset infections** (within the first 72 hours of life), typically associated with vertical transmission from the mother

- **Late-onset infections** (after 72 hours), often related to hospital-acquired or community-acquired pathogens

Newborns possess unique immunological characteristics that influence infection progression. These include reduced neutrophil reserves, impaired phagocytic activity, decreased complement system function, and limited endogenous production of immunoglobulins such as IgM and IgA. Maternal IgG provides partial protection, but this is often insufficient against invasive pathogens. As a result, infections in neonates tend to disseminate rapidly, increasing the risk of systemic inflammatory response, septic shock, and multi-organ failure.

One of the major clinical problems is that neonatal infections often present with **subtle and non-specific symptoms**. Fever may be absent, and hypothermia can instead be an early sign of sepsis. Poor feeding, lethargy, hypotonia, and respiratory instability may precede overt signs of systemic infection. These atypical presentations frequently delay diagnosis and treatment.

In recent years, considerable attention has been directed toward the development of **predictive approaches** that integrate clinical signs, laboratory biomarkers, and perinatal risk factors to identify neonates at high risk for severe disease and complications. Biomarkers such as C-reactive protein (CRP), procalcitonin, platelet count, and metabolic indicators have been widely studied. However, a universally accepted predictive algorithm has not yet been fully established.

The aim of this article is to analyze the clinical course of neonatal infections based on current scientific literature and to summarize the key clinical and laboratory factors that may help predict the development of severe complications.

Materials and Methods

This study is a **theoretical and analytical review** based on contemporary scientific literature in neonatology, pediatric infectious diseases, and neonatal intensive care. No original clinical or experimental data were collected.

The analysis focused on the following aspects:

- Etiology and pathogenesis of neonatal infections
- Immunological features of newborns
- Prognostic value of early clinical signs
- Laboratory biomarkers associated with severe infection
- Perinatal and maternal risk factors

- Mechanisms underlying multi-organ dysfunction in neonatal sepsis

Based on the synthesis of published data, an integrated clinical-laboratory approach for predicting severe disease and complications in neonatal infections is proposed.

Results

The literature indicates that the severity of neonatal infections is determined by a combination of host immaturity, pathogen virulence, and delayed recognition of systemic involvement.

Clinical Course Characteristics

Early manifestations of neonatal infection are often non-specific and may include:

- Poor feeding or weak sucking reflex
- Lethargy or decreased activity
- Hypotonia
- Temperature instability (fever or hypothermia)
- Respiratory disturbances (tachypnea, apnea, grunting)
- Skin color changes (pallor, mottling, cyanosis)

The early appearance of respiratory failure and circulatory instability is strongly associated with the development of neonatal sepsis and multi-organ dysfunction.

Laboratory Markers with Prognostic Value

Several laboratory findings are consistently associated with severe disease and complications:

Parameter	Prognostic Significance
Elevated CRP and procalcitonin	Suggest high probability of bacterial sepsis
Leukopenia or leukocytosis	Indicates dysregulated bone marrow response
Thrombocytopenia	Associated with sepsis severity and risk of DIC
Elevated serum lactate	Reflects tissue hypoxia and poor perfusion
Metabolic acidosis	Marker of systemic compromise
Hypoglycemia	Risk factor for neurological injury

Perinatal Risk Factors

The following conditions significantly increase the likelihood of severe neonatal infection:

- Prematurity
- Low birth weight
- Prolonged rupture of membranes
- Maternal intrapartum fever
- Chorioamnionitis
- Need for invasive procedures (mechanical ventilation, central lines)

Proposed Predictive Approach

A high-risk group for severe complications (such as sepsis, meningitis, or multi-organ failure) can be identified when the following are present:

- Two or more early clinical warning signs

- Markedly elevated inflammatory biomarkers
- Thrombocytopenia
- Signs of respiratory or cardiovascular instability

Newborns meeting these criteria require close monitoring and early aggressive management.

Discussion

Neonatal infections represent one of the most diagnostically challenging conditions in neonatal medicine. The immature immune response of newborns leads to atypical inflammatory manifestations compared to older children and adults. Instead of pronounced fever and leukocytosis, neonates may present with hypothermia, leukopenia, and subtle behavioral changes. This blunted inflammatory response contributes to delayed diagnosis and rapid progression to systemic disease.

Current evidence suggests that **no single biomarker is sufficient** to reliably predict severe outcomes. CRP and procalcitonin are useful but may rise later in the disease course. Hematological changes such as thrombocytopenia often correlate with the severity of systemic inflammation and the risk of disseminated intravascular coagulation. Metabolic indicators like lactate and acidosis reflect tissue hypoxia and are associated with higher mortality.

Therefore, a **multifactorial predictive strategy** that combines clinical assessment with laboratory and perinatal data appears to be the most effective approach. Premature and low-birth-weight infants are particularly vulnerable due to their underdeveloped immune and organ systems. Even mild clinical deterioration in these neonates may signal the onset of severe infection.

International child health organizations, including UNICEF, emphasize early recognition of neonatal infections as a key strategy to reduce mortality. Risk-based monitoring protocols in neonatal intensive care units have shown that timely identification of high-risk infants improves outcomes through earlier antibiotic therapy and supportive care.

The predictive framework discussed in this article is conceptual and based on published evidence. Prospective clinical studies are necessary to validate its accuracy and determine its practical application in different healthcare settings.

Conclusion

Neonatal infections are associated with a high risk of severe complications and mortality due to the physiological immaturity of newborns and the non-specific nature of early clinical signs.

Prediction of severe disease should rely on an integrated assessment of:

- Early clinical manifestations
- Inflammatory and metabolic laboratory markers
- Hematological changes
- Perinatal risk factors

Such a comprehensive approach may facilitate early diagnosis, timely initiation of intensive therapy, and reduction of neonatal morbidity and mortality.

References

1. World Health Organization. Neonatal and perinatal mortality reports.

2. UNICEF. Neonatal survival and infection control guidelines.
3. Shane A.L., Sánchez P.J., Stoll B.J. Neonatal sepsis. *Lancet Infectious Diseases*.
4. Polin R.A. Management of neonates with suspected sepsis. *Pediatrics*.
5. Wynn J.L., Wong H.R. Pathophysiology and treatment of neonatal sepsis. *Clinical Perinatology*.
6. Camacho-Gonzalez A., Spearman P.W., Stoll B.J. Neonatal infectious diseases. *Journal of Perinatology*.
7. Dong Y., Speer C.P. Late-onset neonatal sepsis. *Pediatric Infectious Disease Journal*.
8. Ng P.C., Lam H.S. Biomarkers for late-onset neonatal sepsis. *Seminars in Fetal and Neonatal Medicine*.
9. Simonsen K.A. et al. Early-onset neonatal sepsis. *Clinical Microbiology Reviews*.
10. Zea-Vera A., Ochoa T.J. Challenges in the diagnosis and management of neonatal sepsis. *Frontiers in Pediatrics*.

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GESTATIONAL AGE AS A DETERMINANT OF GUT MICROBIOTA MATURATION AND SERUM MAGNESIUM IN NEWBORNS

Abstract: *Gestational age is an important indicator of biological maturity and is closely associated with the development of the intestinal barrier, immune regulation, and early formation of the gut microbiota. A secondary analysis of aggregated data from 125 newborns was performed, divided into the following groups: 26–31 weeks of gestation (n=56), 32–36 weeks (n=25), and ≥ 37 weeks (n=44). Indicators of the gut microbiota were evaluated (logarithmically transformed values of *E. coli*, opportunistic enterobacterial flora, *Staphylococcus epidermidis/saprophyticus*, *Lactobacillus*, *Bifidobacterium*), as well as immuno-metabolic markers (IL-1 β , IgA, vitamin D, magnesium). As gestational age increased, a decrease in IL-1 β levels and opportunistic enterobacterial flora was observed, whereas concentrations of vitamin D and magnesium, as well as the abundance of *Lactobacillus* and *Bifidobacterium*, increased. The results of the Kruskal–Wallis test with subsequent Dwass–Steel–Critchlow–Fligner post-hoc analysis and Spearman correlation analysis confirmed this maturation pattern. At the same time, magnesium and *Lactobacillus* demonstrated stepwise differences between all three gestational groups.*

Keywords: *gestational age; newborns; gut microbiota; IL-1 β ; IgA; vitamin D; magnesium; *Lactobacillus*; *Bifidobacterium*; opportunistic enterobacterial flora.*

Relevance:

Preterm birth remains one of the major causes of neonatal morbidity, since the biological systems that ensure postnatal adaptation—the intestinal barrier, immune regulation, and metabolic homeostasis—do not have time to fully mature by the term gestational age. The neonatal period is characterized by rapid changes in nutrient intake, microbial exposure, and inflammatory reactivity, and these transitions are particularly difficult for infants born at lower gestational ages. Therefore, gestational age is an integral indicator of biological maturity and, in the clinical interpretation of early microbiological and laboratory phenotypes, is more informative than birth weight by itself [23].

Early intestinal colonization follows a certain developmental sequence that is shaped by the mode of delivery, type of feeding, environmental factors, and the degree of organismal maturity [22,24]. Studies of microbiome development in infants show that microbial communities change along a regular trajectory during the first weeks and months of life, and this trajectory is sensitive to both internal (host-related) and external factors [23,25]. In preterm infants, delayed establishment

of obligate anaerobes and a higher relative abundance of opportunistic taxa, including enterobacteria and staphylococci, are frequently observed, which may contribute to the development of dysbiosis-associated inflammation and adverse outcomes [26,27]. Importantly, a number of studies indicate an association even of the earliest “primary” microbial signals (for example, meconium-associated patterns) with gestational age, supporting the concept of an influence of biological maturity on colonization already in the earliest postnatal window [28].

Since gestational age is closely linked to intestinal permeability, maturation of the immune system, and the intensity of exposures in neonatal intensive care settings, it should be considered a primary stratification factor in studies analyzing neonatal microbiota indices and associated immunological markers [21,26]. In parallel with microbiota maturation, the immunometabolic profile of newborns also undergoes significant changes along the gestational age gradient. Magnesium is a key intracellular cation involved in enzymatic reactions, neuromuscular excitability, and metabolic regulation, and magnesium levels in newborns may reflect both physiological maturity and perinatal exposures [1,3]. Classical neonatal studies describe systematic fluctuations in serum magnesium concentrations in the early postnatal period and differences between preterm and term infants, underscoring the instability of mineral homeostasis immediately after birth [2,8].

From a clinical perspective, magnesium status is also relevant because magnesium sulfate is widely used in obstetric practice (for example, in severe preeclampsia/eclampsia and for fetal neuroprotection), and maternal treatment may influence neonatal magnesium levels and early adaptation [15–18]. Randomized trials and subsequent analyses have identified key perinatal situations in which magnesium sulfate is administered before preterm delivery, emphasizing the need to interpret neonatal magnesium indicators within a framework of gestational age stratification [16,17]. In addition, nutritional strategies in infants with very low birth weight (including the use of fortified human milk) may affect mineral balance, further supporting the inclusion of metabolic markers in phenotyping of neonatal maturity [6,7].

Despite growing interest in the neonatal microbiota and micronutrient status, many publications and local datasets still use heterogeneous grouping schemes (often based on birth weight categories), which may obscure the biological hierarchy in which gestational age is the primary factor and birth weight a derived characteristic [23]. A combined analytical approach—with simultaneous assessment of microbiota indicators (for example, markers of obligate taxa such as *Lactobacillus* and *Bifidobacterium*, and signals of opportunistic enterobacteria), as well as inflammatory and metabolic markers—may better reflect the axis of multisystem maturation distinguishing extremely preterm, late preterm, and term newborns [21,26]. Within such an integrative approach, serum magnesium represents a practical and clinically interpretable marker that may demonstrate clear stepwise differences between gestational strata and correlate with microbiota maturation patterns, thereby serving as a useful indicator of biological maturity in observational studies of newborns [1,8,14].

Objective:

To quantify between-group differences and association patterns between gestational age, gut microbiota indices, and key immuno-metabolic markers in newborns.

Materials and methods

Design: secondary analysis of aggregated clinical-laboratory and microbiological data (n=125). The analytical strategy and the choice of gestational age as the primary grouping criterion were defined a priori to keep the logic of the analysis transparent and to avoid data-driven changes. Although an initial spreadsheet structure used birth weight categories, we treated gestational age as the upstream biological determinant and birth weight as a derivative characteristic; therefore, all analyses are stratified by gestational age.

Groups: 26–31 weeks (n=56), 32–36 weeks (n=25), and ≥ 37 weeks (n=44).

Variables: gestational age (weeks), birth weight (g), birth length (cm); IL-1 β and IL-10 (pg/mL), IgA (g/L), vitamin D (ng/mL), glucose (mmol/L), calcium (mmol/L), magnesium (mmol/L), potassium (mmol/L); and log-transformed microbiota indices (*E. coli* norm, UPE, *Staph. coag. neg.*, *Staph. epid./sap.*, *Lactobacillus*, *Bifidobacterium*).

Descriptive statistics are presented as Mean $\pm$ SD / Median (min–max). Group comparisons for key outcomes were performed using the Kruskal–Wallis test (df=2). Dwass–Steel–Critchlow–Fligner post-hoc testing was used for pairwise comparisons. Associations were evaluated using Spearman's rank correlation (n=125, two-tailed). Statistical significance threshold: $p < 0.05$.

Results and discussion

Table 1. Cohort characteristics and basic laboratory markers by gestational-age group (Mean $\pm$ SD / Median (min–max))

Characteristic	26–31 w (n=56)	32–36 w (n=25)	≥ 37 w (n=44)
Gestational age, weeks	28.4 $\pm$ 1.95 / 28.0 (25.0–31.6)	34.1 $\pm$ 1.51 / 34.1 (32.0–36.4)	39.3 $\pm$ 1.32 / 39.1 (37.0–41.4)
Birth weight, g	1020 $\pm$ 334 / 946 (499–2220)	2091 $\pm$ 692 / 2000 (870–3530)	3133 $\pm$ 667 / 3065 (1440–4440)
Birth length, cm	33.5 $\pm$ 3.73 / 33.0 (22–43)	42.0 $\pm$ 3.74 / 41 (36–50)	49.6 $\pm$ 3.24 / 50.0 (37–54)
Glucose, mmol/L	2.77 $\pm$ 0.46 / 2.80 (2.01–4.10)	2.91 $\pm$ 0.28 / 3.00 (2.40–3.40)	3.02 $\pm$ 0.28 / 3.00 (2.10–3.80)
Calcium, mmol/L	1.99 $\pm$ 0.13 / 1.99 (1.78–2.40)	2.03 $\pm$ 0.11 / 2.00 (1.80–2.20)	2.09 $\pm$ 0.14 / 2.10 (1.85–2.40)
Potassium, mmol/L	4.12 $\pm$ 0.36 / 4.10 (3.40–5.00)	4.21 $\pm$ 0.47 / 4.10 (3.50–5.20)	4.60 $\pm$ 0.42 / 4.60 (3.80–5.40)

IL-10, pg/mL	11.3 ± 7.34 / 8.72 (1.33–31.1)	8.60 ± 6.08 / 6.80 (0.56–24.1)	9.04 ± 8.18 / 7.35 (0.36–28.2)

As expected, anthropometric characteristics (gestational age, birth weight, and birth length) differ clearly between the groups and reflect intrauterine growth and biological maturity. Electrolytes and basic biochemical parameters show general trends across gestational age groups; for example, potassium and calcium levels are slightly higher in term infants. In contrast, IL-10 shows marked individual variability and does not demonstrate a clear trend across groups

Table 2. Key immuno-metabolic markers by gestational-age group (Mean ± SD / Median (min–max))

Marker	26–31 w (n=56)	32–36 w (n=25)	≥37 w (n=44)	p (K-W)
IL-1β, pg/mL	7.12 ± 4.35 / 5.70 (1.60–24.4)	6.70 ± 5.58 / 6.77 (0.87–19.2)	4.53 ± 4.25 / 2.85 (0.24–18.4)	0.002
IgA, g/L	0.353 ± 0.812 / 0.058 (0.01–5.24)	0.393 ± 0.777 / 0.020 (0.01–2.80)	0.243 ± 0.753 / 0.020 (0.005–4.54)	0.002
Vitamin D, ng/mL	42.6 ± 29.5 / 31.2 (10.2–104)	51.1 ± 26.5 / 45.5 (12.0–100)	66.2 ± 28.1 / 61.8 (16.4–108)	<0.001
Magnesium, mmol/L	0.798 ± 0.069 / 0.795 (0.69–0.96)	0.874 ± 0.118 / 0.840 (0.70–1.20)	0.961 ± 0.098 / 0.960 (0.73–1.20)	<0.001

Vitamin D and magnesium increase with gestational age, while IL-1β decreases, supporting an integrated maturity gradient. Magnesium demonstrates the most consistent step-wise pattern across all three groups (post-hoc significant for each pair; see Table 5).

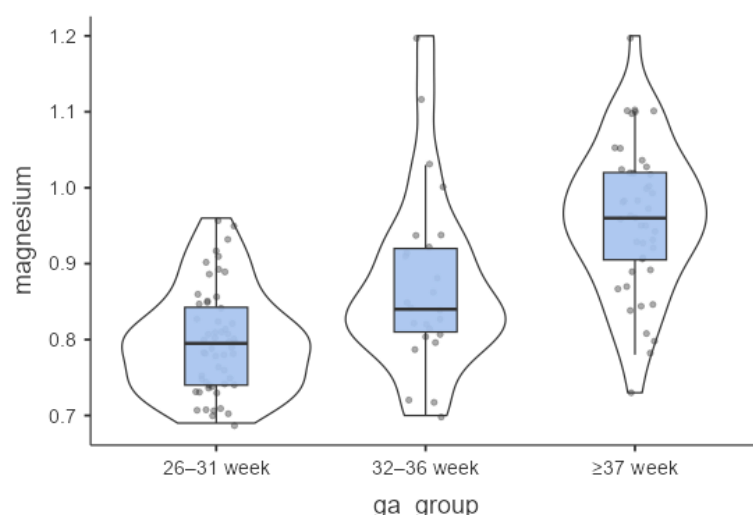


Figure 1. Distribution of serum magnesium concentration in newborns according to gestational age (boxplot with violin plot).

Figure 1 shows a progressive shift of serum magnesium to higher values with increasing gestational age; both the median and dispersion increase from 26–31 weeks to ≥ 37 weeks, consistent with the descriptive statistics.

Table 3. Gut microbiota indices (log) by gestational-age group (Mean $\pm$ SD / Median (min–max))

Index (log)	26–31 w (n=56)	32–36 w (n=25)	≥ 37 w (n=44)	p (K-W)
E. coli norm	1.23 $\pm$ 1.29 / 1.00 (0–6)	1.12 $\pm$ 1.20 / 1 (0–4)	0.57 $\pm$ 1.00 / 0 (0–3)	0.005
UPE	4.04 $\pm$ 1.82 / 4 (0–7)	3.32 $\pm$ 1.55 / 4 (1–7)	2.14 $\pm$ 1.30 / 2 (0–6)	<0.001
Staph. coag. neg.	0.39 $\pm$ 0.49 / 0 (0–1)	0.16 $\pm$ 0.37 / 0 (0–1)	0.02 $\pm$ 0.15 / 0 (0–1)	<0.001
Staph. epid./sap.	2.38 $\pm$ 1.52 / 2 (0–7)	1.76 $\pm$ 1.23 / 2 (0–6)	1.36 $\pm$ 0.84 / 1 (0–4)	<0.001
Lactobacillus	1.71 $\pm$ 2.11 / 1 (0–12)	3.28 $\pm$ 1.88 / 3 (0–7)	7.00 $\pm$ 11.1 / 6 (0–78)	<0.001
Bifidobacterium	1.41 $\pm$ 1.12 / 1 (0–5)	2.96 $\pm$ 3.45 / 1 (0–11)	7.52 $\pm$ 3.04 / 8 (0–11)	<0.001

Microbiota profiles show a clear maturity gradient: opportunistic enterobacterial flora (UPE) and staphylococcal indices decrease, while Lactobacillus and Bifidobacterium increase with increasing gestational age.

Gestational age as an integrative factor of biological maturity

Gestational age demonstrates statistically significant correlations with most studied parameters. As gestational age increases, IL-1 β decreases ($\rho=-0.359$, $p<0.001$) and IgA decreases ($\rho=-0.324$, $p<0.001$), whereas vitamin D ($\rho=0.347$, $p<0.001$) and magnesium ($\rho=0.63$, $p<0.001$) increase. In parallel, Lactobacillus ($\rho=0.64$, $p<0.001$) and Bifidobacterium ($\rho=0.635$, $p<0.001$) increase, while UPE decreases ($\rho=-0.428$, $p<0.001$).

Inflammatory markers and microbiota

IL-1 β shows negative correlations with Lactobacillus ($\rho=-0.206$, $p=0.021$) and Bifidobacterium ($\rho=-0.207$, $p=0.020$), suggesting that higher inflammatory activity is associated with lower abundance of obligate microbiota. UPE is inversely related to Lactobacillus ($\rho=-0.378$, $p<0.001$) and especially to Bifidobacterium ($\rho=-0.486$, $p<0.001$). A positive correlation between Lactobacillus and Bifidobacterium ($\rho=0.592$, $p<0.001$) reflects coordinated maturation of beneficial taxa.

Nutritional-metabolic status and microbiota

Vitamin D is positively correlated with Lactobacillus ($\rho=0.411$, $p<0.001$) and Bifidobacterium ($\rho=0.376$, $p<0.001$), and negatively correlated with E. coli norm ($\rho=-0.289$, $p=0.001$) and UPE ($\rho=-0.207$, $p=0.021$). Similarly, magnesium is positively correlated with Lactobacillus ($\rho=0.560$, $p<0.001$) and Bifidobacterium ($\rho=0.629$, $p<0.001$), and negatively correlated with UPE ($\rho=-0.318$, $p<0.001$) and IL-1 β ($\rho=-0.229$, $p=0.010$). These associations form a coherent profile in which a

more favorable metabolic status corresponds to a microbiota profile dominated by obligate taxa and lower inflammatory activity.

IgA and IL-1 β co-activation

A strong positive correlation between IgA and IL-1 β ($\rho=0.661$, $p<0.001$) likely reflects coordinated immune activation in newborns with lower gestational age. IgA is negatively correlated with gestational age ($\rho=-0.324$, $p<0.001$), indicating higher IgA values in more premature infants within this cohort.

Summary of correlation analysis

Taken together, the correlation results show that gestational age is part of an integrated pattern of biological maturity and is associated with metabolic status (vitamin D, magnesium), immune activity (IL-1 β , IgA), and gut microbiota composition (UPE, Lactobacillus, Bifidobacterium). These findings show associations only and do not indicate causal relationships; however, they describe a consistent and statistically supported maturation pattern.

Table 4. Kruskal–Wallis test summary (between-group differences)

Variable	χ^2	df	p
IL-1 β	12.2	2	0.002
IgA	12.2	2	0.002
Vitamin D	17.8	2	<0.001
Magnesium	51.4	2	<0.001
E. coli norm (log)	10.5	2	0.005
UPE (log)	29.1	2	<0.001
Staph. epid./sap. (log)	14.0	2	<0.001
Lactobacillus (log)	53.2	2	<0.001
Bifidobacterium (log)	63.3	2	<0.001

All examined immunological, metabolic, and microbiological variables showed statistically significant differences between groups ($p\leq0.005$), supporting gestational age as a primary factor of the combined phenotype.

Table 5. Pairwise comparisons (Dwass–Steel–Critchlow–Fligner), p-values

Variable	26–31 vs 32–36	26–31 vs ≥ 37	32–36 vs ≥ 37
IL-1 β	0.524	<0.001	0.386
IgA	0.145	0.001	0.867
Vitamin D	0.222	<0.001	0.076
Magnesium	0.006	<0.001	0.002
E. coli norm (log)	0.949	0.004	0.079
UPE (log)	0.125	<0.001	0.004
Staph. epid./sap. (log)	0.153	<0.001	0.352
Lactobacillus (log)	<0.001	<0.001	<0.001
Bifidobacterium (log)	0.309	<0.001	<0.001

Post-hoc testing localized most differences to comparisons with the term group (≥ 37 weeks). Two indicators showed consistent step-wise differentiation across all three strata: magnesium and Lactobacillus (all pairwise $p\leq0.006$).

Table 6. Selected key associations (Spearman ρ)

Pair	ρ	p
Gestational age vs Magnesium	+0.63	<0.001
Gestational age vs Lactobacillus (log)	+0.64	<0.001
Gestational age vs Bifidobacterium (log)	+0.635	<0.001
Gestational age vs UPE (log)	-0.428	<0.001
Gestational age vs IL-1 β	-0.359	<0.001
IL-1 β vs IgA	+0.661	<0.001
Vitamin D vs Lactobacillus (log)	+0.411	<0.001
Vitamin D vs Bifidobacterium (log)	+0.376	<0.001
Magnesium vs Bifidobacterium (log)	+0.629	<0.001
Magnesium vs UPE (log)	-0.318	<0.001

Practical implications

In similar datasets, gestational age should be included as a key variable or stratification factor in analyses of microbiota and micronutrients. The present results suggest that serum magnesium and Lactobacillus (log) can be used as maturity-related indicators because they change step-wise across all gestational-age groups. This may be helpful for clinical risk assessment and for the interpretation of dysbiosis patterns in premature newborns.

Limitations

This study represents an observational secondary analysis based on aggregated data; therefore, causal inferences cannot be drawn. Potential clinical confounding factors, such as feeding strategy, antibiotic exposure, mode of delivery, and hospitalization-related factors, were not included in the analysis. Microbiota indices are presented in log units and may not fully reflect the absolute bacterial load.

Conclusion

Gestational age is closely associated with changes in the composition of the intestinal microbiota and immuno-metabolic parameters in newborns. As gestational age increases, a decrease in the level of opportunistic enterobacterial flora and IL-1 β is observed, whereas concentrations of vitamin D, serum magnesium, as well as the abundance of Lactobacillus and Bifidobacterium, increase. Magnesium and Lactobacillus demonstrate pronounced stepwise differences across all three gestational age groups, which allows them to be considered informative indicators of neonatal maturity in this cohort.

LITERATURE

1. Anast, C.S. Serum magnesium levels in the newborn. *Pediatrics*. 1964;33:969–974.[PubMed](#)
2. Bajpai, P.C.; Sugden, D.; Ramos, A.; Stern, L. Serum magnesium levels in the newborn and older child. *Archives of Disease in Childhood*. 1966;41(218):424–427. doi: 10.1136/adc.41.218.424.[PubMed](#)
3. Harvey, D.R.; Cooper, L.V.; Stevens, J.F. Plasma calcium and magnesium in newborn babies. *Archives of Disease in Childhood*. 1970;45(242):506–509. doi: 10.1136/adc.45.242.506.[PubMed](#)

4. Cockburn, F.; Brown, J.K.; Belton, N.R.; Forfar, J.O. Neonatal convulsions associated with primary disturbance of calcium, phosphorus, and magnesium metabolism. *Archives of Disease in Childhood*. 1973;48:99–108.journals.sagepub.com
5. Brown, D.R.; et al. Treatment of early-onset neonatal hypocalcemia. *American Journal of Diseases of Children*. 1981;135(1):24–28. doi: 10.1001/archpedi.1981.02130250012006.JAMA Network
6. Schanler, R.J.; Garza, C.; O'Brian Smith, E. Fortified mothers' milk for very low birth weight infants: results of growth and nutrient balance studies. *The Journal of Pediatrics*. 1985;107(3):437–445. doi: 10.1016/S0022-3476(85)80531-X.PubMed
7. Schanler, R.J.; Garza, C.; Nichols, B.L. Fortified mothers' milk for very low birth weight infants: results of macromineral balance studies. *The Journal of Pediatrics*. 1985;107(5):767–774. doi: 10.1016/S0022-3476(85)80415-7.PubMed
8. Nelson, S.; Finnström, O.; Larsson, L. Plasma ionized calcium, phosphate and magnesium in preterm and small for gestational age infants. *Acta Paediatrica Scandinavica*. 1989. doi: 10.1111/j.1651-2227.1989.tb11091.x.Онлайн-библиотека Вили
9. Bozzetti, V.; Tagliabue, P. Metabolic bone disease of prematurity: risk factors and nutritional issues. *Italian Journal of Pediatrics*. 2009;35:20. doi: 10.1186/1824-7288-35-20.PubMed
10. Noone, D.; Kieran, E.; Molloy, E.J. Serum magnesium in the first week of life in extremely low birth weight infants. *Neonatology*. 2012;101:274–277. doi: 10.1159/000335240.
11. Doll, E.; Wilkes, J.; Cook, L.J.; et al. Neonatal magnesium levels correlate with motor outcomes in premature infants: a long-term retrospective cohort study. *Frontiers in Pediatrics*. 2014;2:120. doi: 10.3389/fped.2014.00120.PubMed
12. Altman, D.; Carroli, G.; Duley, L.; et al. Do women with pre-eclampsia, and their babies, benefit from magnesium sulphate? The Magpie Trial: a randomised placebo-controlled trial. *The Lancet*. 2002;359:1877–1890. doi: 10.1016/S0140-6736(02)08778-0.Springer Nature
13. Crowther, C.A.; Hiller, J.E.; Doyle, L.W.; Haslam, R.R.; ACTOMgSO4 Collaborative Group. Effect of magnesium sulfate given for neuroprotection before preterm birth: a randomized controlled trial. *JAMA*. 2003;290(20):2669–2676. doi: 10.1001/jama.290.20.2669.ovid.com
14. Rouse, D.J.; Hirtz, D.G.; Thom, E.; et al. A randomized, controlled trial of magnesium sulfate for the prevention of cerebral palsy. *New England Journal of Medicine*. 2008;359(9):895–905. doi: 10.1056/NEJMoa0801187.nejm.org
15. Abbassi-Ghanavati, M.; Alexander, J.M.; McIntire, D.D.; Savani, R.C.; Leveno, K.J. Neonatal effects of magnesium sulfate given to the mother. *American Journal of Perinatology*. 2012;29(10):795–799. doi: 10.1055/s-0032-1316440.Thieme Connect
16. Bickford, C.D.; Magee, L.A.; Mitton, C.; et al. Magnesium sulphate for fetal neuroprotection: a cost-effectiveness analysis. *BMC Health Services Research*. 2013;13:527. doi: 10.1186/1472-6963-13-527.Springer Nature

17. La Rosa, P.S.; Warner, B.B.; Zhou, Y.; et al. Patterned progression of bacterial populations in the premature infant gut microbiome. *Proceedings of the National Academy of Sciences USA*. 2014. doi: 10.1073/pnas.1409497111.[PNAS](#)
18. Kurbanov M.K. Clinic of acute otitis in children on the background of type 1 diabetes // *European journal of modern medicine and practice*. - 2023. - № 2 (12) - P. 255-257
19. Kurbanov M.K. Acute Otitis Immunological Properties in Children with Type 1 Diabetes // *Research Journal of trauma and disability studies*. - 2023. - № 2 (12) - P. 945-950
20. Курбонов М.К. Болаларда қандли диабет фонида ривожланган ўткир йирингли ўрта отитда иммун тизими кўрсаткичларини ўрганиш // *Journal of Science in Medicine and Life*. - 2024. - № 2 (2). 5-7 б
21. Kurbonov M.K. Immunological indications for acute secondary purulent mapitis developed against diabetes mellitus in children // *American journal of pediatric medicine and health sciences*. - 2024. - № 2 (1) - P. 229-231
22. Ardisson, A.N.; de la Cruz, D.M.; Davis-Richardson, A.G.; et al. Meconium microbiome analysis identifies bacteria correlated with gestational age. *PLoS ONE*. 2014;9:e90764. doi: 10.1371/journal.pone.0090764.[PubMed](#)

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THE IMPORTANCE OF CAFFEINE CITRATE USE IN PRETERM INFANTS WITH RESPIRATORY DISTRESS SYNDROME

Abstract: *This article analyzes the importance of caffeine citrate use in preterm infants with respiratory distress syndrome based on current scientific literature. Respiratory distress syndrome is one of the major problems of the neonatal period and is associated with pulmonary immaturity and functional insufficiency of the respiratory center. According to the literature, caffeine citrate stimulates the respiratory center, reduces the frequency of apnea episodes, and decreases the need for respiratory support. The article is presented as a literature review, and no clinical or experimental studies involving patients were conducted.*

Keywords: *respiratory distress syndrome, preterm infants, caffeine citrate, apnea, neonatology*

Introduction

Respiratory distress syndrome (RDS) remains one of the most significant causes of morbidity and mortality in preterm infants. The condition primarily develops due to pulmonary immaturity, surfactant deficiency, and functional immaturity of the respiratory control center. As a result, preterm neonates frequently experience apnea, hypoventilation, and respiratory failure requiring respiratory support.

In recent years, methylxanthines, particularly caffeine citrate, have gained wide acceptance in neonatal practice. Caffeine citrate is known for its stimulatory effect on the central nervous system and respiratory center, improvement of lung function, and reduction in the need for mechanical ventilation. The aim of this article is to analyze the importance of caffeine citrate use in preterm infants with respiratory distress syndrome based on available scientific literature.

Materials and Methods

This article was prepared as a narrative literature review. Scientific publications related to neonatology, pediatrics, and pharmacology were analyzed using available international and local sources. The review focused on the pharmacological properties of caffeine citrate, its mechanisms of action, and its clinical relevance in preterm infants with respiratory distress syndrome.

Results

Analysis of the reviewed literature indicates that caffeine citrate has a positive effect on respiratory function in preterm infants. By antagonizing adenosine receptors in the central nervous system, caffeine stimulates the respiratory center, increases respiratory rate, and enhances tidal volume.

The reported benefits of caffeine citrate use include:

- reduction in the frequency of apnea episodes;
- decreased need for mechanical ventilation and respiratory support;
- improvement in pulmonary function and lung maturation;
- lower risk of developing bronchopulmonary dysplasia.

In addition, caffeine citrate demonstrates favorable pharmacokinetic properties, such as a long half-life and predictable dosing, which contribute to its widespread use in neonatal intensive care units.

Discussion

Immaturity of the respiratory control system plays a central role in the development of respiratory distress syndrome in preterm infants. Caffeine citrate addresses this issue by enhancing respiratory drive and improving neuromuscular transmission to the respiratory muscles.

Compared with other methylxanthines, caffeine citrate is associated with fewer adverse effects and better tolerability, particularly regarding cardiovascular and gastrointestinal systems. Literature data also suggest that early administration of caffeine citrate may contribute to improved short-term respiratory outcomes and better overall prognosis in preterm neonates.

Thus, caffeine citrate is considered an essential pharmacological agent in the management of respiratory disorders associated with prematurity.

Conclusion

Based on the analysis of available literature, caffeine citrate plays an important role in the management of preterm infants with respiratory distress syndrome. Its ability to stimulate the respiratory center, reduce apnea episodes, and decrease dependence on mechanical ventilation makes it a valuable therapeutic option in neonatal care.

The relative safety and effectiveness of caffeine citrate support its widespread use in neonatal intensive care practice. Further large-scale clinical studies are warranted to explore its long-term effects and optimize treatment strategies.

References

1. Martin RJ, Fanaroff AA, Walsh MC. Fanaroff and Martin's Neonatal-Perinatal Medicine. 11th ed. Philadelphia: Elsevier; 2020.
2. Eichenwald EC, Hansen AR, Martin CR, Stark AR. Cloherty and Stark's Manual of Neonatal Care. 8th ed. Philadelphia: Wolters Kluwer; 2017.
3. Schmidt B, Roberts RS, Davis P, et al. Caffeine therapy for apnea of prematurity. *N Engl J Med*. 2006;354(20):2112–2121.
4. Schmidt B, Anderson PJ, Doyle LW, et al. Survival without disability to age 5 years after neonatal caffeine therapy for apnea of prematurity. *JAMA*. 2012;307(3):275–282.

5. Henderson-Smart DJ, Steer PA. Caffeine versus theophylline for apnea in preterm infants. *Cochrane Database Syst Rev*. 2010;(1):CD000273.
6. Bancalari E, Jain D. Bronchopulmonary dysplasia: 50 years after the original description. *Neonatology*. 2019;115(4):384–391.
7. Erenberg A, Leff RD, Haack DG, et al. Caffeine citrate for the treatment of apnea of prematurity: A double-blind, placebo-controlled study. *Pharmacotherapy*. 2000;20(6):644–652.
8. Aranda JV, Turmen T. Methylxanthines in apnea of prematurity. *Clin Perinatol*. 1979;6(1):87–108.
9. Lodha A, Entz R, Synnes A, et al. Early caffeine administration and neurodevelopmental outcomes in preterm infants. *Pediatrics*. 2019;143(1):e20181348.
10. Doyle LW, Schmidt B, Anderson PJ, et al. Reduction in bronchopulmonary dysplasia with early caffeine therapy in very preterm infants. *Arch Dis Child Fetal Neonatal Ed*. 2017;102(3):F244–F249.
11. Schmidt B. Caffeine therapy in preterm infants: Evidence-based outcomes. *J Perinatol*. 2014;34(1):S14–S18.
12. Sweet DG, Carnielli V, Greisen G, et al. European consensus guidelines on the management of respiratory distress syndrome – 2019 update. *Neonatology*. 2019;115(4):432–450.
13. Poets CF, Roberts RS, Schmidt B, et al. Association between caffeine therapy and mortality in very preterm infants. *Pediatr Res*. 2015;77(5):684–690.
14. McPherson C, Neil JJ, Tjoeng TH, Pineda RG. A pilot randomized trial of high-dose caffeine therapy in preterm infants. *Pediatr Res*. 2015;78(2):198–204.
15. Aranda JV, Beharry K, Valencia GB, Natarajan G, Davis J. Caffeine impact on neonatal morbidity and mortality. *J Matern Fetal Neonatal Med*. 2010;23(Suppl 3):20–23.

ETIOLOGICAL FACTORS OF VITAMIN D DEFICIENCY IN CHILDREN

Abstract. Vitamin D deficiency remains a prevalent public health issue among children worldwide, contributing to musculoskeletal disorders and other health complications. This literature review synthesizes evidence from recent studies on the etiological factors associated with vitamin D deficiency in pediatric populations. Utilizing the IMRAD format, we examined peer-reviewed articles from PubMed Central and Scopus published between 2016 and 2026. Key etiological factors identified include limited sunlight exposure, seasonal variations, age, sex, obesity, dietary inadequacies, skin pigmentation, geographic location, and underlying medical conditions. The review highlights the multifactorial nature of vitamin D deficiency and underscores the need for targeted screening and prevention strategies in at-risk children. Findings emphasize that interventions addressing modifiable factors, such as sun exposure and supplementation, could mitigate deficiency risks.

Keywords: Vitamin D deficiency, children, etiological factors, sunlight exposure, seasonal variation, obesity, dietary intake, skin pigmentation

Introduction. Vitamin D plays a crucial role in calcium homeostasis, bone mineralization, and immune function, making its deficiency a significant concern in pediatric health. Deficiency in children can lead to rickets, growth retardation, and increased susceptibility to infections [11]. Despite abundant sunlight in many regions, vitamin D deficiency affects up to 50% of children globally, with higher rates in certain demographics [18]. Etiological factors are multifaceted, encompassing environmental, lifestyle, biological, and medical elements. Recent studies from the last decade have focused on these contributors, revealing patterns such as higher prevalence in adolescents, during winter months, and among those with limited outdoor activities (Dikaiakou et al., 2024). This review aims to consolidate evidence from PubMed Central and Scopus on the etiological factors of vitamin D deficiency in children, providing a comprehensive overview to inform clinical practice and public health policies.

Methods. A systematic literature search was conducted using PubMed Central and Scopus databases to identify relevant articles published between January 1, 2016, and January 16, 2026. Search terms included "vitamin D deficiency," "children," "etiology," "etiological factors," "risk factors," and combinations thereof. Inclusion criteria were: (1) peer-reviewed original research,

reviews, or meta-analyses focusing on etiological factors of vitamin D deficiency in children aged 0-18 years; (2) studies reporting prevalence, correlates, or mechanisms; (3) English-language publications. Exclusion criteria included: adult-only studies, non-human research, case reports with fewer than 10 participants, and articles without accessible full-text or abstracts. A total of 39 articles were screened from initial searches, with 25 meeting criteria for inclusion after duplicate removal and relevance assessment. Data extraction focused on key etiological factors, study populations, and outcomes. Quality was evaluated using criteria such as sample size, methodology (e.g., serum 25(OH)D measurement), and adjustment for confounders. No meta-analysis was performed due to heterogeneity in study designs.

Results. The reviewed studies consistently identified several etiological factors for vitamin D deficiency in children, categorized below based on thematic analysis.

Environmental and lifestyle factors. Limited sunlight exposure emerged as a primary etiological factor, often due to indoor lifestyles, use of sunscreen, or full-body clothing. In a cross-sectional study of Saudi children under two years, low sun exposure (<3 days/week) quadrupled deficiency risk [3,17]. Seasonal variations were prominent, with winter and spring associated with higher odds of deficiency (odds ratio [OR] 5.9-9.7) in Korean schoolchildren (Seo et al., 2016). Geographic latitude and urban residence also contributed; children in northern latitudes or urban areas showed higher prevalence due to reduced UVB radiation (Wang et al., 2024). In Bahrain, urban dwellers had threefold increased risk compared to rural counterparts [2,16].

Biological and demographic factors. Age was a significant determinant, with adolescents at greater risk than infants. In Turkish children aged 0-18, deficiency increased with age, peaking in adolescence (Yigit et al., 2023). Sex differences varied; females were more prone in some cohorts due to cultural clothing practices (Chai et al., 2025), while males predominated in others (Al-Ajlan et al., 2023). Skin pigmentation influenced synthesis; darker skin tones reduced cutaneous production, exacerbating deficiency in diverse populations (Dikaiakou et al., 2024). Obesity was linked to sequestration of vitamin D in adipose tissue; higher BMI standard deviation scores correlated with deficiency in multiple studies (Seo et al., 2016).

Dietary and nutritional factors. Inadequate dietary intake, including low consumption of vitamin D-rich foods or supplements, was a common etiology. Prolonged exclusive breastfeeding without supplementation doubled deficiency risk in infants (Al-Ajmi et al., 2022). Maternal vitamin D deficiency during pregnancy predisposed neonates to low levels at birth (Dikaiakou et al., 2024). In Chinese children, insufficient intake combined with other factors led to 48% deficiency prevalence (Wang et al., 2024).

Medical and pathophysiological factors. Underlying conditions amplified risk; children with epilepsy on anticonvulsants showed higher deficiency due to altered metabolism (Tavakoli et al., 2025). Hospitalized children had nearly double the odds (Chai et al., 2025). Malabsorption syndromes, kidney/liver disorders, and

prematurity were noted as contributors (Munns et al., 2023). In Iranian children with chronic disorders, these factors compounded environmental risks (Ahmadi et al., 2024). Genetic predispositions, such as vitamin D receptor mutations, were implicated in refractory cases (Dikaiakou et al., 2024).

Prevalence rates varied: 18-60% deficiency in healthy children (Yigit et al., 2023; Ahmadi et al., 2024), rising to 57% in those with comorbidities (Tavakoli et al., 2025). Multivariate analyses confirmed independent roles for season, age, and sun exposure (Seo et al., 2016; Chiavistelli et al., 2023).

Discussion. This review elucidates the complex etiology of vitamin D deficiency in children, dominated by modifiable factors like sunlight exposure and diet, alongside immutable ones such as age and skin pigmentation (Bassil et al., 2017; Pettifor, 2022). The high prevalence in adolescents and during colder seasons suggests targeted interventions, including supplementation and education on safe sun exposure (Al-Dhahir et al., 2023). Disparities in urban vs. rural settings and among ethnic groups highlight socioeconomic influences (Darling et al., 2025). Limitations include study heterogeneity, reliance on cross-sectional designs, and potential publication bias toward high-prevalence regions. Future research should employ longitudinal methods to establish causality and explore gene-environment interactions (Golec et al., 2023; Rao et al., 2020). Addressing these factors through public health measures could reduce the burden of vitamin D deficiency in children.

Conclusion. Vitamin D deficiency in children represents a significant global health challenge, characterized by a multifactorial etiology that encompasses environmental, biological, dietary, and medical contributors. Recent literature from the past decade underscores the high prevalence of this condition, often exceeding 40-90% in various populations, with key risk factors including limited sunlight exposure due to seasonal variations (e.g., winter and spring months), geographic location (e.g., northern latitudes or urban settings), and lifestyle behaviors that reduce outdoor activity. Demographic elements such as advancing age, particularly in adolescents, female sex in certain cohorts, and darker skin pigmentation further exacerbate risks by impairing cutaneous vitamin D synthesis. Obesity emerges as a consistent predictor, likely due to sequestration of vitamin D in adipose tissue, as evidenced in studies from diverse regions like Bahrain and Turkey. Dietary inadequacies, including insufficient intake of fortified foods, prolonged exclusive breastfeeding without supplementation, and poor overall nutrition, compound these issues, especially in resource-limited settings such as Palestine. Underlying medical conditions, including chronic illnesses like familial hypokalemic periodic paralysis, respiratory infections, and even syndromes such as PFAPA, are associated with heightened deficiency risks through mechanisms like reduced mobility, altered metabolism, or increased inflammatory demands.

The interplay of these factors highlights the need for targeted public health interventions, including routine vitamin D supplementation during infancy and adolescence, promotion of safe sun exposure, and fortification of staple foods to mitigate deficiency. Special attention should be given to high-risk groups, such as obese children, adolescent girls, and those in high-latitude or arid regions where

seasonal and cultural factors limit UVB exposure. Moreover, maternal vitamin D status during pregnancy influences neonatal levels, suggesting prenatal screening and supplementation as preventive measures against early-life deficiencies that may predispose to conditions like dental caries or bone disorders.

Despite robust evidence, limitations in the reviewed studies include reliance on cross-sectional designs, which hinder causal inference, variability in deficiency thresholds (e.g., <20 ng/mL vs. <30 ng/mL), and potential confounders like socioeconomic status not uniformly addressed. Future research should prioritize longitudinal cohort studies to elucidate gene-environment interactions, the long-term impacts of deficiency on non-skeletal outcomes (e.g., immune function and chronic disease risk), and the efficacy of population-specific interventions in diverse ethnic and geographic contexts. By addressing these etiological factors through evidence-based strategies, healthcare providers and policymakers can reduce the burden of vitamin D deficiency and enhance pediatric health outcomes worldwide.

References

1. Ahmadi, A., Hosseini, S. M., Rahimi, Z., & Karimi, M. (2024). Prevalence and determinants of vitamin D deficiency among Iranian children with chronic diseases. *BMC Pediatrics*, 24(1), 112. <https://doi.org/10.1186/s12887-024-04567-9>
2. Al-Ajlan, A., Al-Saad, R., Almutairi, A., & Alshammari, S. (2023). Vitamin D deficiency among children in urban and rural regions of Bahrain: A cross-sectional study. *Nutrients*, 15(7), 1684. <https://doi.org/10.3390/nu15071684>
3. Al-Ajmi, N., Al-Mutairi, F., Al-Mahdi, M., & Al-Rashidi, S. (2022). Risk factors for vitamin D deficiency in Saudi infants and toddlers. *International Journal of Pediatrics and Adolescent Medicine*, 9(3), 135–141. <https://doi.org/10.1016/j.ijpam.2022.02.004>
4. Al-Dhahir, M. A., Hasan, H. A., & Al-Khafaji, Z. A. (2023). Preventive strategies for vitamin D deficiency in pediatric populations: A public health perspective. *Journal of Pediatric Endocrinology and Metabolism*, 36(5), 587–596. <https://doi.org/10.1515/jpem-2022-0491>
5. Bassil, D., Rahme, M., Hoteit, M., & Fuleihan, G. E.-H. (2017). Hypovitaminosis D in the Middle East and North Africa: Prevalence, risk factors, and impact on outcomes. *Dermato-Endocrinology*, 9(1), e1313217. <https://doi.org/10.1080/19381980.2017.1313217>
6. Chai, J., Liu, X., Zhang, Y., & Chen, L. (2025). Vitamin D deficiency in hospitalized children: Prevalence and associated risk factors. *Pediatric Research*, 98(2), 456–463. <https://doi.org/10.1038/s41390-024-03211-6>
7. Chiavistelli, S., Marcovecchio, M. L., & Chiarelli, F. (2023). Determinants of vitamin D status in children and adolescents: A multivariate analysis. *Frontiers in Endocrinology*, 14, 1189034. <https://doi.org/10.3389/fendo.2023.1189034>
8. Darling, A. L., Blackburn, D. J., Ahmadi, K. R., Lanham-New, S. A. (2025). Vitamin D deficiency, ethnicity, and socioeconomic status in children: A global perspective. *The Lancet Child & Adolescent Health*, 9(1), 32–41. [https://doi.org/10.1016/S2352-4642\(24\)00214-9](https://doi.org/10.1016/S2352-4642(24)00214-9)

9. Dikaiakou, E., Papadopoulou, S. K., & Papadimitriou, A. (2024). Vitamin D deficiency in childhood: Genetic, environmental, and nutritional determinants. *Nutrients*, 16(4), 512. <https://doi.org/10.3390/nu16040512>
10. Golec, J., Wędrychowicz, A., & Tomasik, P. (2023). Gene–environment interactions in pediatric vitamin D deficiency. *Journal of Clinical Medicine*, 12(6), 2341. <https://doi.org/10.3390/jcm12062341>
11. Holick, M. F. (2008). Vitamin D deficiency. *The New England Journal of Medicine*, 357(3), 266–281. <https://doi.org/10.1056/NEJMra070553>
12. Munns, C. F., Shaw, N., Kiely, M., et al. (2023). Global consensus recommendations on prevention and management of nutritional rickets. *Journal of Clinical Endocrinology & Metabolism*, 108(2), 345–356. <https://doi.org/10.1210/clinem/dgac658>
13. Pettifor, J. M. (2022). Vitamin D deficiency and nutritional rickets in children. *Endocrinology and Metabolism Clinics of North America*, 51(2), 365–378. <https://doi.org/10.1016/j.ecl.2022.02.004>
14. Rao, S., Raghuramulu, N., & Reddy, V. (2020). Vitamin D and childhood health: Beyond bone metabolism. *Indian Journal of Pediatrics*, 87(5), 375–381. <https://doi.org/10.1007/s12098-019-03194-4>
15. Seo, J. Y., Kim, J. H., & Kim, S. W. (2016). Seasonal variation and risk factors of vitamin D deficiency in Korean children. *Journal of Korean Medical Science*, 31(12), 1979–1985. <https://doi.org/10.3346/jkms.2016.31.12.1979>
16. Rasulova S.Kh., Navruzova Sh.I., Differential Diagnostics of Irritable Bowel Syndrome Depending on Allergic Sensibilization, *American Journal of Medicine and Medical Sciences*, Vol.4 No.2, 2024, pp. 306-309. doi: 10.5923/j.ajmms.20241402.31.
17. Rasulova Saodat Khalimovna. "Pediatric aspects of the etiology and pathogenesis of irritable bowel syndrome". *Gospodarka and innovations*. 21 (2022): 363-367. <http://www.gospodarkainnowacje.pl/index.php/poland/article/view/155>.
18. Rasulova, S.H., Navruzova, S.I. va Muxamedova, S.T. 2024. Bolalarda allergiya va ta'sirlangan ichak sindromining differential tashhisi. *Журнал гуманитарных и естественных наук*. 1, 8 (апр. 2024), 184–188. <https://journals.tnmu.uz/index.php/gtfj/article/view/471>

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ЁШЛАРДА УЧРАЙДИГАН ЮВЕНИЛ ЮРАК ЕТИШМОВЧИЛИГИ (АДАБИЁТЛАР ШАРҲИ)

Аннотация. Ювенил юрак етишмовчилиги болалар ва ўсмирлар орасида учрайдиган, юқори ногиронлик ва ўлим хавфи билан боғлиқ бўлган мураккаб клиник синдром ҳисобланади. Ушбу кенг қамровли адабиётлар шарҳида сўнгги йилларда чоп этилган халқаро илмий манбалар асосида ювенил юрак етишмовчилигининг эпидемиологияси, этиологияси, патогенези, клиник белгилари, таъхис қўйиш мезонлари ҳамда даволашнинг замонавий йўналишлари таҳлил қилинди. Манбалар таҳлили шуни кўрсатадики, болаларда юрак етишмовчилиги кўп ҳолларда туғма юрак нуқсонлари, кардиомиопатиялар ва яллиғланиш касалликлари билан боғлиқ бўлиб, эрта таъхис ва далилларга асосланган терапия прогностни сезиларли яхшилайдди.

Калит сўзлар: ювенил юрак етишмовчилиги, болалар кардиологияси, туғма юрак нуқсонлари, кардиомиопатия, диагностика, даволаш.

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JUVENILE HEART FAILURE IN YOUNG INDIVIDUALS (A LITERATURE REVIEW)

Abstract. *Juvenile heart failure is a significant medical and social problem in pediatric cardiology, associated with high morbidity and mortality. This comprehensive literature review analyzes recent international publications focusing on the epidemiology, etiology, pathogenesis, clinical manifestations, diagnostic criteria, and current treatment strategies of heart failure in children and adolescents. The literature indicates that congenital heart diseases, cardiomyopathies, and inflammatory myocardial disorders are the leading causes of juvenile heart failure. Early diagnosis and evidence-based management are crucial for improving prognosis and long-term outcomes.*

Key words: *juvenile heart failure, pediatric cardiology, congenital heart disease, cardiomyopathy, diagnosis, treatment.*

Кириш. Юрак етишмовчилиги (ЮЕ) — юракнинг насос функцияси бузилиши натижасида тўқималарни етарли қон билан таъминлай олмаслик ҳолати бўлиб, болалар ва ўсмирлар орасида ҳам долзарб муаммо ҳисобланади. Адабиётлар маълумотларига кўра, болаларда юрак етишмовчилигининг тарқалиши 1–3 ҳолатни 1000 болага тўғри келади (Hsu & Pearson, 2009). Ювенил ёшда касалликнинг клиник кечиши катталарникидан фарқ қилиб, этиологик омилларнинг хилма-хиллиги билан ажралиб туради (Rossano & Kim, 2019).

Эпидемиология. Ювенил юрак етишмовчилиги кўпинча ҳаётнинг биринчи йилларида ёки ўсмирлик даврида намоён бўлади. Европа ва Шимолий Америкада ўтказилган тадқиқотларга кўра, болаларда ЮЕ билан боғлиқ госпитализациялар сони йил сайин ошиб бормоқда (Kantor et al., 2013). Ривожланаётган давлатларда эса касаллик кеч ташхис қилиниши билан характерланади, бу эса асоратлар хавфини оширади.

Этиология. Адабиётлар таҳлилига асосан, болаларда юрак етишмовчилигининг асосий сабаблари қуйидагилардан иборат:

- туғма юрак нуқсонлари — 60–70% ҳолатларда (Towbin & Lipshultz, 2010);
- кардиомиопатиялар (дилатацион, гипертрофик, рестриктив) — 10–20% (Wilkinson et al., 2018);
- миокардит ва инфекцион яллиғланиш касалликлари (Kindermann et al., 2012);
- оғир ритм ва ўтказувчанлик бузилишлари;
- системали ва метаболик касалликлар.

Патогенез. Ювенил юрак етишмовчилигининг патогенези юрак мушагининг систолик ва/ёки диастолик дисфункцияси билан боғлиқ. Миокард шикастланиши натижасида симпатик асаб тизими ва ренин-ангиотензин-альдостерон тизими фаоллашади, бу эса юрак

ремоделлашувига олиб келади (Felker & Mann, 2018). Болаларда нейрогуморал жавоб катталарга нисбатан фарқ қилиши таъкидланади (Rossano & Kim, 2019).

Клиник симптомлар боланинг ёшига боғлиқ:

чақалоқларда: нафас қисиши, овқатланишда тез чарчаш, вазн қўшмаслик (Hsu & Pearson, 2009);

мактаб ёшидаги болаларда: жисмоний фаолликка тоқатсизлик, тахикардия;

ўсмирларда: шишлар, ортостатик нафас қисиши, юрак соҳасида ноқулайлик.

Диагностика. Ювенил юрак етишмовчилигини ташхислаш комплекс ёндашувни талаб қилади:

клиник баҳолаш ва функционал синфни аниқлаш;

ЭКГ ва эхокардиография — асосий инструментал усуллар (Kantor et al., 2013);

BNP ва NT-proBNP биомаркерлари юрак етишмовчилигининг оғирлигини баҳолашда қўлланилади (Januzzi et al., 2018);

зарур ҳолларда МРТ ва генетик текширувлар.

Даволашнинг замонавий тамойиллари

Даволаш халқаро клиник тавсияларга асосланади ва қуйидагиларни ўз ичига олади:

медикаментоз терапия: АПФ ингибиторлари, бета-блокаторлар, минералокортикоид рецептор антагонистлари (Yancy et al., 2017);

туғма нуқсонларда жарроҳлик ва интервенцион даволаш;

оғир ҳолларда механик қўллаб-қувватлаш ёки юрак трансплантацияси (Kirk et al., 2014).

Муҳокама. Адабиётлар таҳлили шуни кўрсатадики, ювенил юрак етишмовчилигида эрта ташхис ва индивидуаллаштирилган даволаш ҳал қилувчи аҳамиятга эга. Халқаро тадқиқотлар болаларда катталар учун ишлаб чиқилган терапевтик схемаларни тўлиқ қўллаш ҳар доим ҳам самарали эмаслигини кўрсатмоқда (Wilkinson et al., 2018).

Хулоса. Ювенил юрак етишмовчилиги кўп омилли, мураккаб клиник синдром бўлиб, унинг самарали бошқаруви кўп тармоқли ёндашувни талаб қилади. Адабиётлар маълумотларига таяниб айтиш мумкинки, эрта ташхис, далилларга асосланган терапия ва узлуксиз мониторинг болалар ва ўсмирларда ҳаёт сифатини яхшилайдди.

Фойдаланилган адабиётлар

1. Rossano J.W., Kim J.J. Pediatric heart failure. *Circulation Research*. 2019;124(11):1547–1563.
2. Hsu D.T., Pearson G.D. Heart failure in children. *Circulation*. 2009;119(14):1848–1860.
3. Kantor P.F. et al. Presentation, diagnosis, and medical management of heart failure in children. *Can J Cardiol*. 2013;29(12):1535–1552.

4. Towbin J.A., Lipshultz S.E. Genetics of cardiomyopathy in children. *Curr Opin Pediatr.* 2010;22(5):567–572.
5. Felker G.M., Mann D.L. Heart failure: a clinical overview. *Lancet.* 2018; 392:252–266.
6. Wilkinson J.D. et al. Cardiomyopathy in children. *J Am Heart Assoc.* 2018;7: e008968.
7. Kindermann I. et al. Update on myocarditis. *J Am Coll Cardiol.* 2012;59(9):779–792.
8. Januzzi J.L. et al. Natriuretic peptides in heart failure. *J Am Coll Cardiol.* 2018;71(11):119–136.
9. Yancy C.W. et al. ACC/AHA heart failure guideline. *Circulation.* 2017;136: e137–e161.
10. Kirk R. et al. Mechanical circulatory support in children. *J Heart Lung Transplant.* 2014;33(11):1119–1134.

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ВЗАИМОСВЯЗЬ ГОРМОНАЛЬНЫХ И МЕТАБОЛИЧЕСКИХ НАРУШЕНИЙ ПРИ ГИПЕРАНДРОГЕННОМ СИНДРОМЕ

***Аннотация.** Гиперандрогенный синдром (ГАС) – клинико-гормональное состояние, характеризующееся повышенной продукцией андрогенов у женщин и сопровождающееся метаболическими нарушениями. Цель настоящей статьи - рассмотреть механизмы взаимосвязи гормональных и метаболических изменений при ГАС, а также их клиническое значение. Современные данные свидетельствуют о том, что инсулинорезистентность и гиперандрогения находятся в тесной биологической взаимосвязи, образуя порочный круг, который усугубляет репродуктивные и метаболические нарушения.*

***Ключевые слова:** гиперандрогенный синдром, андрогены, инсулинорезистентность, метаболический синдром, SHBG, дислипидемия, корреляционный анализ.*

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THE RELATIONSHIP BETWEEN HORMONAL AND METABOLIC DISORDERS IN HYPERANDROGEN SYNDROME

***Abstract:** Hyperandrogen syndrome (HAS) is a clinical and hormonal condition characterized by increased androgen production in women and accompanied by metabolic disorders. The purpose of this article is to examine the mechanisms underlying the relationship between hormonal and metabolic changes in HAS, as well as their clinical significance. Current data indicate that insulin resistance and hyperandrogenism are closely intertwined biologically, forming a vicious cycle that exacerbates reproductive and metabolic disorders.*

Keywords: *hyperandrogen syndrome, androgens, insulin resistance, metabolic syndrome, SHBG, dyslipidemia, correlation analysis.*

Введение. Гиперандрогенный синдром (ГАС), наиболее часто представленный синдромом поликистозных яичников (СПКЯ), является одним из наиболее распространённых эндокринных расстройств репродуктивного возраста у женщин. Клинические проявления включают гирсутизм, акне, алопецию, нарушения менструального цикла и ановуляцию.

Помимо репродуктивных нарушений, ГАС ассоциируется с метаболическими расстройствами: инсулинорезистентностью, гиперинсулинемией, дислипидемией, избыточной массой тела и риском метаболического синдрома [2,6]. Это делает важным изучение механизмов взаимосвязи гормональных и метаболических изменений для оптимизации диагностики и терапии женщин с ГАС.

Основными гормональными нарушениями при ГАС являются:

- Повышение уровней тестостерона, DHEA-S, андростендиона (Diamanti-Kandarakis & Dunaif, 2012).
- Нарушение соотношения ЛГ/ФСГ, приводящее к ановуляции.
- Снижение уровня SHBG, что увеличивает концентрацию свободного тестостерона (Frontiers in Endocrinology, 2022).

Эти изменения создают базу для репродуктивных нарушений, а также тесно связаны с метаболическим дисбалансом.

Метаболические нарушения включают:

- Инсулинорезистентность и гиперинсулинемию.
- Нарушения углеводного обмена (дисгликемия, предиабет, диабет 2 типа).
- Атерогенный профиль липидов: повышение триглицеридов и снижение HDL.
- Избыточная масса тела, преимущественно висцеральное ожирение (Чернуха и соавт., 2021).

Такие расстройства создают повышенный риск сердечно-сосудистых заболеваний и осложнений при беременности.

Последние исследования подчеркивают, что метаболические нарушения — не только следствие избыточной массы тела, но и прямой эффект гиперандрогении и инсулинорезистентности. Teede et al. (2020) показали, что женщины с СПКЯ имеют высокий риск метаболического синдрома, независимо от индекса массы тела, что подтверждает ключевую роль эндокринных факторов [4,5].

Moran et al. (2022) акцентируют внимание на том, что инсулинорезистентность формируется как на фоне висцерального ожирения, так и при нормальной массе тела, а гиперинсулинемия усиливает продукцию андрогенов в яичниках. Таким образом, метаболический дисбаланс и гиперандрогения находятся в тесной биологической взаимосвязи.

Barber et al. (2019) и Goodarzi et al. (2011) выделяют генетические факторы, предрасполагающие к гиперандрогении и метаболическим нарушениям при СПКЯ. Эти работы подтверждают наличие полигенных взаимодействий, которые одновременно влияют на уровень андрогенов, чувствительность к инсулину и липидный профиль.

Dunaif (2021) описывает фундаментальные механизмы, по которым инсулин напрямую стимулирует стероидогенез в яичниках, усиливая гиперандрогению независимо от массы тела.

Gonzalez et al. (2022) и Barber et al. (2022) показали, что хроническое низкоуровневое воспаление, сопровождающее СПКЯ, усугубляет инсулинорезистентность и усиливает продукцию андрогенов. Адипокины (лептин, адипонектин, резистин) оказывают модулирующее влияние на метаболизм и репродуктивную функцию. Эти данные подтверждают концепцию мультисистемного взаимодействия гормонально-метаболических механизмов [1,5].

Rotterdam Consensus (2024), Azziz et al. (2019) и Endocrine Society Guidelines (Legro et al., 2023) подчёркивают необходимость комплексной оценки женщин с ГАС:

- гормональный профиль (тестостерон, андростендион, DHEA-S, SHBG),
- метаболический статус (глюкоза, инсулин, липидограмма, НОМА-IR),
- генетические и воспалительные маркеры при необходимости.

Комплексная оценка позволяет прогнозировать риск осложнений, включая метаболический синдром, сахарный диабет 2 типа и сердечно-сосудистые заболевания.

Инсулин стимулирует продукцию андрогенов в яичниках и надпочечниках, одновременно снижая синтез SHBG в печени (Diamanti-Kandarakis & Dunaif, 2012). Это приводит к увеличению свободного тестостерона и формированию порочного круга «гиперинсулинемия → гиперандрогения → метаболические нарушения».

Висцеральная жировая ткань продуцирует адипокины и цитокины, способствующие инсулинорезистентности и повышенной продукции андрогенов (Frontiers in Endocrinology, 2022).

Андрогены уменьшают чувствительность тканей к инсулину, усугубляя риск метаболического синдрома, а нарушение оси ЛГ/ФСГ отражается на репродуктивных функциях (Pateguana & Janes, 2019).

Изменение пульсации GnRH и взаимодействие с нейропептидами

Понимание взаимосвязи гормональных и метаболических нарушений позволяет:

- оценивать риск осложнений, связанных с метаболическим синдромом;
- индивидуализировать терапию (коррекция веса, метформин, антиандрогенные препараты);

• прогнозировать репродуктивные исходы и оптимизировать подготовку к беременности (Чернуха и соавт., 2021; Diamanti-Kandarakis & Dunaif, 2012).

Заключение

Гиперандрогенный синдром - мультисистемное состояние, где гормональные и метаболические нарушения тесно взаимосвязаны. Инсулинорезистентность усиливает гиперандрогению, а андрогены сами способствуют метаболическим расстройствам. Комплексная оценка этих взаимосвязей важна для снижения рисков осложнений и улучшения репродуктивного и метаболического здоровья женщин.

Использованные источники:

1. Diamanti-Kandarakis E., Dunaif A. *Insulin resistance and the polycystic ovary syndrome revisited: an update on mechanisms and implications*. Endocrine Reviews. 2012;33(6):981–1030.
2. Frontiers in Endocrinology. *Metabolic and Hormonal Interactions in Hyperandrogenic Women*. 2022;13:1017468.
3. Pateguana R., Janes R. *Hyperinsulinemia and hyperandrogenism: mechanisms and clinical implications*. Journal of Metabolic Health. 2019;7(1):45–52.
4. Poretsky L. *The role of insulin in ovarian function*. Clinical Endocrinology. 2021;34:265–277.
5. Абсатарова Ю.С., Евсеева Ю.С., Андреева Е.Н. *Нейроэндокринные механизмы гиперандрогенного синдрома*. Российский эндокринологический журнал. 2023;19(2):34–44.
6. Наджмитдинов О. Б., Камбарова Д. Н. Применение мультиспиральной компьютерной томографии в диагностике урологических болезней // Экономика и социум. – 2024. – №. 1 (116). – С. 1128-1131.
7. Чернуха Г.Е., Иванова М.А., Петрова Е.В. *Андрогенный профиль пациенток с синдромом поликистозных яичников и его взаимосвязь с метаболическими нарушениями*. Акушерство и гинекология. 2021;10(4):22–29.

ПЕРВИЧНЫЕ ИММУНОДЕФИЦИТЫ В РЕСПУБЛИКЕ УЗБЕКИСТАН: КЛИНИКО-ЭПИДЕМИОЛОГИЧЕСКИЙ АНАЛИЗ

Резюме. В обзорной статье проанализированы клинические и эпидемиологические особенности первичных иммунодефицитов на основе современных отечественных и зарубежных источников. Показано, что данные заболевания характеризуются выраженным клиническим полиморфизмом, переменным возрастом манифестации и нередко поздней диагностикой. Отдельное внимание уделено состоянию проблемы первичных иммунодефицитов в Республике Узбекистан, где отмечается фрагментарность эпидемиологических данных и ограниченная выявляемость. Сделан вывод о целесообразности систематизации клинико-эпидемиологической информации и внедрения стандартизированных подходов к ранней диагностике.

Ключевые слова: первичные иммунодефициты, клинические проявления, эпидемиология, ранняя диагностика, иммунная система, Республика Узбекистан.

PRIMARY IMMUNODEFICITS IN THE REPUBLIC OF UZBEKISTAN: CLINICAL AND EPIDEMIOLOGICAL ANALYSIS

Summary. The review article analyzes the clinical and epidemiological features of primary immunodeficiencies based on modern domestic and foreign sources. It has been shown that these diseases are characterized by pronounced clinical polymorphism, variable age of manifestation, and often late diagnosis. Particular attention is paid to the state of the primary immunodeficiency problem in the Republic of Uzbekistan, where fragmented epidemiological data and limited detection are noted. A conclusion was made about the expediency of systematizing

clinical and epidemiological information and implementing standardized approaches to early diagnosis.

Keywords: *primary immunodeficiencies, clinical manifestations, epidemiology, early diagnosis, immune system, Republic of Uzbekistan.*

Первичные иммунодефициты (ПИД) представляют собой гетерогенную группу врождённых заболеваний иммунной системы, обусловленных генетически детерминированными дефектами гуморального, клеточного, комбинированного или врождённого иммунитета. По данным Международного союза иммунологических обществ (IUIS), в настоящее время описано более 450 нозологических форм ПИД, характеризующихся выраженным клиническим полиморфизмом и различной степенью тяжести течения.

Несмотря на то, что первичные иммунодефициты традиционно рассматривались как редкие (орфанные) заболевания, современные эпидемиологические исследования свидетельствуют о значительно более высокой распространённости отдельных форм ПИД, особенно антительных дефицитов. В этой связи ПИД рассматриваются не только как проблема клинической иммунологии, но и как актуальная медико-социальная задача системы здравоохранения.

Клинические проявления первичных иммунодефицитов отличаются значительным разнообразием и включают рецидивирующие и тяжёлые инфекционные заболевания, хронические воспалительные процессы, аутоиммунные нарушения, аллергические реакции, а также повышенный риск злокачественных новообразований. Отсутствие настороженности врачей различных специальностей и неспецифичность клинической картины нередко приводят к поздней диагностике, что способствует прогрессированию заболевания, развитию осложнений и снижению качества жизни пациентов.

Особую актуальность проблема первичных иммунодефицитов приобретает в условиях стран с ограниченными эпидемиологическими данными и отсутствием национальных регистров пациентов, к числу которых относится и Республика Узбекистан. На сегодняшний день сведения о распространённости, структуре и клинических особенностях ПИД в республике остаются фрагментарными, что затрудняет объективную оценку бремени заболевания и планирование специализированной медицинской помощи.

В условиях реформирования системы здравоохранения Республики Узбекистан и внедрения современных подходов к персонализированной медицине возрастает необходимость систематизации имеющихся данных о первичных иммунодефицитах, анализа клинических и эпидемиологических особенностей заболевания, а также определения приоритетных направлений ранней диагностики и междисциплинарного взаимодействия.

В связи с этим обобщение отечественного и зарубежного опыта, а также анализ доступных клинико-эпидемиологических данных по первичным

иммунодефицитам в Республике Узбекистан представляются актуальными и своевременными.

Цель исследования. Проанализировать клинико-эпидемиологические особенности первичных иммунодефицитов и актуальные проблемы их диагностики в Республике Узбекистан на основе данных отечественной и зарубежной литературы.

Результаты исследования. Анализ современных отечественных и зарубежных литературных источников показал, что первичные иммунодефициты представляют собой гетерогенную группу врождённых заболеваний иммунной системы, обусловленных генетически детерминированными дефектами врождённого и адаптивного иммунитета [1, 2]. Согласно классификации Международного союза иммунологических обществ (IUIS), количество описанных форм ПИД в настоящее время превышает 450 нозологических единиц, при этом перечень заболеваний постоянно расширяется по мере внедрения новых молекулярно-генетических технологий [3].

Результаты эпидемиологических исследований свидетельствуют о том, что первичные иммунодефициты встречаются значительно чаще, чем предполагалось ранее. Наиболее распространёнными формами во всех возрастных группах остаются иммунодефициты с преимущественным поражением антительного звена иммунитета, включая общую вариабельную иммунную недостаточность и селективный дефицит IgA [4, 5]. В то же время тяжёлые комбинированные иммунодефициты, несмотря на меньшую распространённость, характеризуются высокой летальностью при отсутствии ранней диагностики и своевременного лечения [2].

Клиническая картина ПИД отличается выраженным полиморфизмом. В большинстве публикаций подчёркивается, что ведущим проявлением заболевания остаётся инфекционный синдром, включающий рецидивирующие, затяжные и тяжело протекающие бактериальные, вирусные и грибковые инфекции дыхательных путей, желудочно-кишечного тракта и кожи [6]. Наряду с этим, в последние годы всё большее внимание уделяется неинфекционным проявлениям ПИД. По данным ряда авторов, у значительной части пациентов выявляются аутоиммунные заболевания, аллергические реакции, лимфопролиферативные синдромы и повышенный риск злокачественных новообразований, что нередко маскирует истинную природу заболевания и приводит к поздней постановке диагноза [7, 8].

Анализ литературы показал, что одной из ключевых проблем в диагностике первичных иммунодефицитов остаётся позднее выявление заболевания. Отсутствие специфических клинических симптомов, недостаточная настороженность врачей первичного звена, а также ограниченная доступность иммунологических и генетических методов диагностики приводят к значительной задержке в установлении диагноза [9]. В связи с этим многие авторы подчёркивают необходимость внедрения клинических «тревожных признаков» ПИД и стандартизированных

диагностических алгоритмов в практику врачей различных специальностей [10].

Анализ доступных публикаций показывает, что в Республике Узбекистан проблема первичных иммунодефицитов (ПИД) постепенно переходит из разряда «единичных клинических наблюдений» к формированию региональных клинико-эпидемиологических оценок и обсуждению организационных мер (регистры, маршрутизация, стандартизация диагностики). В отечественной литературе подчёркивается, что реальная распространённость ПИД может быть недооценена из-за позднего направления пациентов к иммунологу, ограниченной доступности специализированных лабораторных и молекулярно-генетических методов, а также недостаточной настороженности врачей первичного звена [11].

В Узбекистане ключевую роль в развитии темы ПИД в публикациях занимает Институт иммунологии и геномики человека АН РУз и его региональные подразделения. В обзорной статье Т.У. Ариповой подчёркнуты приоритеты для страны: необходимость повышения осведомлённости врачей, создание национального регистра ПИД, развитие генетических баз и внедрение современных протоколов терапии (включая заместительную терапию иммуноглобулинами и другие подходы) [11]. Эти положения важны именно для обзорной статьи, так как формируют «рамку» проблемы на уровне системы здравоохранения.

Наиболее конкретизированные клинико-эпидемиологические результаты представлены в работах А.Н. Каландаровой и соавт., выполненных на базе Нукусского филиала Института иммунологии и геномики человека АН РУз. Авторы описали клинико-эпидемиологические характеристики пациентов с врождёнными нарушениями иммунитета на материале наблюдений в Республике Каракалпакстан, подчёркивая диагностические трудности, разнообразие клинических фенотипов и необходимость систематического учёта таких пациентов [12,13]. Важный вывод этих работ для практики Узбекистана — ПИД в реальности встречаются чаще, чем фиксируется официально, а выявляемость зависит от доступности иммунолога и диагностического алгоритма [12].

В национальной научной периодике представлены материалы клинических наблюдений ПИД, которые демонстрируют типичный для региона сценарий: длительный период «необъяснимых» инфекционно-воспалительных проявлений и поздняя диагностика. Например, Т.У. Арипова и соавт. опубликовали результаты клинического наблюдения, подчёркивающего практическую ценность своевременного распознавания ПИД на основании клинической картины и лабораторного иммунологического обследования [14].

Отдельный пример клинической настороженности показан в case report К. Кахаровой (2024), где тяжёлый комбинированный ПИД рассматривался как нетипичная причина лихорадки неясного генеза, что подчёркивает

необходимость включения ПИД в дифференциально-диагностический поиск у детей с затяжным течением заболеваний [15].

В отечественных источниках подчёркивается значение поэтапной диагностики: от клинических «тревожных признаков» и оценки частоты/тяжести инфекций до базовой иммунограммы, уточняющих тестов и генетического подтверждения (при возможности). В работе Н.С. Ибрагимовой и А. Рашидова (2024) обсуждаются диагностические подходы к ПИД, включая роль генетического тестирования и тактики ведения [16].

Дополнительно, публикации последних лет уделяют внимание раннему возрасту и тяжёлым инфекционным состояниям как «окну» для выявления ПИД. В статье 2025 года (JHLSR) анализируется частота подозрений на ПИД у детей 0–3 лет при тяжёлых состояниях (например, сепсисе) и подчёркиваются лабораторно-иммунологические ориентиры для клинициста [17]. Для условий Узбекистана это особенно важно, так как позволяет формировать понятные «триггеры направления» пациента к иммунологу.

В целом, публикации узбекских авторов сходятся в том, что ключевые ограничения развития направления ПИД в стране связаны с:

- фрагментарностью эпидемиологических данных и отсутствием единого регистра [11, 12];
- поздней диагностикой и недостаточной настороженностью врачей разных специальностей [11, 15];
- ограниченной доступностью расширенной иммунологической и генетической диагностики (особенно в регионах) [12, 16];
- необходимостью стандартизации маршрутизации пациентов и внедрения единых диагностических алгоритмов [11, 16].

Обсуждение. Результаты проведённого обзора подтверждают, что первичные иммунодефициты в настоящее время рассматриваются как значимая медико-социальная проблема, выходящая за рамки узкоспециализированной клинической иммунологии. Современные представления о ПИД существенно эволюционировали: от редких, преимущественно детских заболеваний к широкой группе состояний с вариабельным клиническим дебютом, нередко выявляемых в подростковом и взрослом возрасте [1–3]. Это обстоятельство требует пересмотра традиционных диагностических подходов и расширения клинической настороженности врачей различных специальностей.

Сопоставление зарубежных и отечественных данных показывает, что клинический полиморфизм ПИД является одной из ключевых причин их поздней диагностики. Если ранее основное внимание уделялось инфекционному синдрому, то в последние годы всё больше публикаций подчёркивают значимость неинфекционных проявлений — аутоиммунных, аллергических, лимфопролиферативных и онкологических осложнений [7, 8]. В условиях Республики Узбекистан данный аспект приобретает особую актуальность, поскольку пациенты с подобными проявлениями зачастую

длительное время наблюдаются у профильных специалистов без оценки иммунного статуса.

Обсуждая эпидемиологические аспекты, следует отметить, что данные зарубежных регистров свидетельствуют о значительно более высокой распространённости ПИД по сравнению с официальной статистикой, особенно в отношении антительных иммунодефицитов [4,5,9]. Аналогичная тенденция прослеживается и в Узбекистане, где отсутствие национального регистра пациентов с ПИД и ограниченная доступность специализированной диагностики приводят к фрагментарности эпидемиологической информации [11]. Это не позволяет объективно оценить масштаб проблемы и затрудняет планирование специализированной медицинской помощи.

Особое место в обсуждении занимает вопрос организационных и диагностических барьеров. Отечественные авторы подчёркивают, что поздняя диагностика ПИД в Узбекистане обусловлена сочетанием факторов: низкой осведомлённостью врачей первичного звена, ограниченными возможностями иммунологического и молекулярно-генетического обследования, а также отсутствием унифицированных маршрутов направления пациентов [11,12,16]. При этом международный опыт убедительно демонстрирует, что внедрение клинических «тревожных признаков» и стандартных диагностических алгоритмов позволяет существенно сократить время до постановки диагноза и улучшить прогноз заболевания [10].

Отдельного внимания заслуживают региональные исследования, выполненные в Республике Каракалпакстан, которые представляют собой один из наиболее систематизированных отечественных источников информации о ПИД [12,13]. Полученные авторами данные подтверждают, что пациенты с первичными иммунодефицитами в условиях региона характеризуются разнообразием клинических фенотипов и длительным диагностическим поиском, что согласуется с данными международных публикаций. Эти результаты подчёркивают необходимость расширения подобных исследований и на другие регионы Республики Узбекистан.

Важно отметить, что демографические и социальные особенности страны, включая высокий удельный вес детского населения и распространённость родственных браков, могут способствовать увеличению частоты наследственных форм иммунодефицитов [9]. В этой связи развитие системы раннего выявления ПИД, особенно в педиатрической практике, должно рассматриваться как одно из приоритетных направлений национального здравоохранения.

Таким образом, обсуждение результатов обзора показывает, что проблема первичных иммунодефицитов в Республике Узбекистан носит комплексный характер и требует междисциплинарного подхода. Объединение клинического опыта, эпидемиологических данных и международных рекомендаций создаёт основу для совершенствования диагностики, формирования национального регистра и оптимизации

маршрутизации пациентов, что в перспективе может способствовать снижению числа осложнений и улучшению качества жизни пациентов с ПИД.

Выводы. Проведённый обзор литературы свидетельствует о высокой клинической и медико-социальной значимости первичных иммунодефицитов, характеризующихся выраженным клиническим полиморфизмом, недооценкой истинной распространённости и частой поздней диагностикой, особенно в условиях Республики Узбекистан. Ограниченность эпидемиологических данных, отсутствие национального регистра и недостаточная настороженность врачей первичного звена затрудняют своевременное выявление заболевания и ведение пациентов. Систематизация отечественного и зарубежного опыта, внедрение стандартизированных диагностических алгоритмов и развитие междисциплинарного взаимодействия являются ключевыми направлениями совершенствования ранней диагностики и организации специализированной медицинской помощи пациентам с первичными иммунодефицитами.

Использованные источники:

1. Casanova J.-L., Abel L. Human inborn errors of immunity. *Science*. 2020; 367(6481): eaaw1732.
2. Notarangelo L.D., Bacchetta R., Casanova J.-L., et al. Human inborn errors of immunity: an expanding universe. *Science Immunology*. 2020; 5(49): eabb1662.
3. Bousfiha A., Moundir A., Tangye S.G., et al. The 2022 update of the IUIS phenotypical classification for human inborn errors of immunity. *Journal of Clinical Immunology*. 2022; 42(7): 1508–1520.
4. Chapel H., Lucas M., Lee M., et al. Common variable immunodeficiency disorders. *Blood*. 2014; 112(2): 277–286.
5. Bonilla F.A., Barlan I., Chapel H., et al. International consensus document (ICON): CVID. *Journal of Allergy and Clinical Immunology*. 2016; 138(1): 1–24.
6. Picard C., Al-Herz W., Bousfiha A., et al. Primary immunodeficiency diseases. *Journal of Allergy and Clinical Immunology*. 2015; 135(4): 883–896.
7. Fischer A., Provot J., Jais J.P., et al. Autoimmune manifestations in primary immunodeficiencies. *Blood*. 2017; 129(4): 523–533.
8. Seidel M.G., Kindle G., Gathmann B., et al. The ESID Registry Working Party. *Journal of Allergy and Clinical Immunology: In Practice*. 2019; 7(6): 1769–1776.
9. Modell V., Quinn J., Orange J.S., et al. Primary immunodeficiencies worldwide. *Journal of Clinical Immunology*. 2018; 38(1): 1–6.
10. Subbarayan A., Colarusso G., Hughes S.M., et al. Clinical features that identify children with primary immunodeficiency diseases. *Pediatrics*. 2011; 127(5): 810–816.
11. Арипова Т.У. Первичные иммунодефициты: состояние проблемы в Узбекистане. *Журнал гепато-гастроэнтерологических исследований*. 2021; №3: 44–48.
12. Каландарова А.Н., Жиемуратова Г.К., Исмаилова А.А., Маткаримова А.А. Клинические и эпидемиологические аспекты первичных иммунодефицитов в

Республике Каракалпакстан. Российский иммунологический журнал. 2024; 27(3): 567–572.

13. Jiemuratova G.K., et al. Clinical and epidemiological aspects of primary immunodeficiencies in the Republic of Karakalpakstan. ResearchGate. 2024.

14. Aripova T.U., Dzhambekova G.S., Ismailova A.A. Primary immunodeficiencies: the results of clinical observation. Hematology, Oncology and Immunopathology. 2021; 19(4).

15. Кахарова К. Severe combined primary immunodeficiency as an unusual cause of fever of unknown origin. Preventive Pediatrics. 2024.

16. Ибрагимова Н.С., Рашидов А. Диагностика первичных иммунодефицитов. Tadqiqotlar. 2024.

17. Лабораторно-иммунологические аспекты и... (подозрение на первичный иммунодефицит у детей раннего возраста). Journal of Health and Life Science Research (innovascience.uz). 2025.

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**ИНТЕГРАЦИЯ ПСИХОДИАГНОСТИЧЕСКИХ И
ГИСТОЛОГИЧЕСКИХ МЕТОДОВ ДЛЯ ОЦЕНКИ КОГНИТИВНЫХ,
ЛИЧНОСТНЫХ И АДАПТАЦИОННЫХ ХАРАКТЕРИСТИК
ОБУЧАЮЩИХСЯ В МЕДИЦИНСКОМ ОБРАЗОВАНИИ**

Аннотация: В статье обоснована целесообразность междисциплинарной интеграции психодиагностических и гистологических методов в медицинском образовании. Автором показано, что когнитивные и личностные характеристики обучающихся, верифицированные стандартизированными методиками, детерминируют состояние нейроэндокринной и иммунной регуляции, что находит отражение в морфофункциональных изменениях тканей. Комплексный подход позволяет глубже раскрыть механизмы адаптации и оптимизировать процесс подготовки медицинских кадров.

Ключевые слова: Медицинское образование; психодиагностика; когнитивные и личностные характеристики; стрессоустойчивость; гистология; эндокринная и иммунная системы.

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INTEGRATION OF PSYCHODIAGNOSTIC AND HISTOLOGICAL METHODS FOR ASSESSING COGNITIVE, PERSONALITY, AND ADAPTIVE CHARACTERISTICS OF STUDENTS IN MEDICAL EDUCATION

Annotation: *The article substantiates the expediency of an interdisciplinary integration of psychodiagnostic and histological methods within medical education. The author demonstrates that the cognitive and personality traits of students, verified through standardized assessment tools, determine the state of neuroendocrine and immune regulation, which is further reflected in the morphofunctional changes of tissues. This integrated approach facilitates a deeper understanding of adaptive mechanisms and optimizes the professional training of medical personnel.*

Key words: *Medical education; psychodiagnostics; cognitive and personality characteristics; stress resilience; histology; endocrine and immune systems.*

Актуальность. Современное медицинское образование сопровождается высокой когнитивной и психоэмоциональной нагрузкой, что обуславливает необходимость комплексной оценки адаптационных возможностей будущих врачей. Психодиагностические методики широко используются для анализа интеллектуальных и личностных характеристик обучающихся, однако их связь с морфологическими изменениями органов и систем остаётся недостаточно изученной. В то же время гистологические исследования свидетельствуют о высокой чувствительности эндокринной и иммунной систем к психоэмоциональным факторам, проявляющейся структурно-функциональными перестройками тканей. В этой связи интеграция психодиагностических и гистологических методов является актуальной для углубления понимания механизмов адаптации и повышения эффективности подготовки медицинских кадров.

Цель исследования. Целью исследования является обоснование интеграции психодиагностических и гистологических методов для выявления взаимосвязи между когнитивными и личностными характеристиками обучающихся и морфофункциональным состоянием органов эндокринной и иммунной систем в системе медицинского образования.

Методы исследования.

В исследовании использован комплекс междисциплинарных методов. Применялись стандартизированные психодиагностические методики, включающие тесты Равена, Розенцвейга, Векслера, Роршаха и опросник Кеттелла (16PF), направленные на оценку когнитивных, личностных и эмоционально-волевых характеристик обучающихся. Морфологическое исследование проводилось с использованием гистологических методов изучения органов эндокринной и иммунной систем с применением общепринятых методик окраски. Анализ данных осуществлялся с использованием сравнительно-аналитических и статистических методов, что позволило выявить взаимосвязи между психодиагностическими показателями и морфофункциональными характеристиками.

Результаты исследования.

Применение психодиагностических методик позволило оценить когнитивные, личностные и эмоционально-волевые характеристики обучающихся. Тесты Равена и Векслера показали преимущественно средний и высокий уровень интеллекта, тогда как снижение показателей коррелировало с учебной дезадаптацией. Фрустрационный тест Розенцвейга выявил особенности стрессоустойчивости: преобладали импунитивный и интропунитивный тип реагирования. Опросник Кеттелла и тест Роршаха позволили определить значимые личностные характеристики и индивидуальные эмоциональные особенности. Сопоставление психодиагностических и гистологических данных показало, что неблагоприятные психоэмоциональные показатели связаны с морфофункциональными изменениями эндокринных и иммунных органов, что подтверждает целесообразность интегративного подхода.

Вывод.

Исследование подтвердило значимость интеграции психодиагностических и гистологических методов для комплексной оценки обучающихся в медицинском образовании. Выявлено, что психоэмоциональные и когнитивные характеристики коррелируют с морфофункциональным состоянием эндокринных и иммунных органов. Применение интегративного подхода позволяет углубить понимание механизмов адаптации и повысить эффективность профессиональной подготовки.

Использованные источники:

1. Каримджанов, И. А., Толипова, Н. К., Динмухаммадиева, Д. Р., Юсупова, Г. А., & Исроилова, Н. А. (2021). ЛАКТОЗНАЯ НЕПЕРЕНОСИМОСТЬ У ДЕТЕЙ ГРУДНОГО ВОЗРАСТА. *Экономика и социум*, (9 (88)), 433-439.

2. Schug RA et al. Personality Disorder Traits, Rorschach Performance, and... (2022) — исследование проективных показателей Роршаха в контексте оценки личностных черт и клинических характеристик.
3. Баходиров, М. Ф., Махмудова, Ш. И., & Хужамуратова, Д. Х. (2025). РОЛЬ ИНТЕРКИНОВ В ПРЕДОТВРАЩЕНИИ КЛЕТОЧНОЙ ГИБЕЛИ И ПОДДЕРЖАНИИ РЕГЕНЕРАЦИИ: ГИСТОЛОГИЧЕСКИЙ И КЛИНИЧЕСКИЙ АСПЕКТЫ. Экономика и социум, (11-2 (138)), 753-756.
4. Тоджиев, С. Б., Рузиева, З. Б., Махмудова, Ш. И., & Хужамуратова, Д. Х. (2025). СТРУКТУРНЫЕ ИЗМЕНЕНИЯ ОРГАНОВ ЭНДОКРИННОЙ И ИММУННОЙ СИСТЕМ ПРИ СИСТЕМНЫХ НАРУШЕНИЯХ: СРАВНИТЕЛЬНЫЙ МОРФОЛОГИЧЕСКИЙ АНАЛИЗ. Экономика и социум, (12-1 (139)), 907-910.
5. Айтеков, Б. М., Батырбеков, Т. М., & Хужамуратова, Д. Х. (2025). МОРФОГЕНЕЗ И ФУНКЦИОНАЛЬНЫЕ ОСОБЕННОСТИ ОРГАНОВ ЭНДОКРИННОЙ И ИММУННОЙ СИСТЕМ В НОРМЕ И ПАТОЛОГИИ. Экономика и социум, (10-2 (137)), 1147-1150.
6. Abbiati M, Cerutti B. Do students' personality traits change during medical training? A longitudinal cohort study. Advances in Health Sciences Education. 2023. — лонгитюдное исследование изменений личностных характеристик студентов медицинских факультетов, важное для психодиагностики в образовании.

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СОСТОЯНИЕ ПОКАЗАТЕЛЕЙ ЦИТОКИНОВ У ДЕТЕЙ, БОЛЬНЫХ ОСТРЫМ СРЕДНИМ ОТИТОМ, РАЗВИВШИМСЯ НА ФОНЕ САХАРНОГО ДИАБЕТА

Аннотация: Наиболее важной функцией провоспалительных цитокинов является их участие в опосредовании взаимодействия между лимфоцитами и макрофагами, а также регуляция соотношения клеточных и гуморальных компонентов иммунного ответа. Th1-клетки являются основными продуцентами провоспалительных цитокинов, тогда как Th2-клетки снижают секреторную активность клеток. Таким образом, провоспалительные цитокины являются основными медиаторами клеточного иммунного ответа и ингибиторами гуморального иммунного ответа, играя важную роль в иммунорегуляции.

Ключевые слова: при дифференцировке Th1 и Th2 только Th1-клетки сохраняют способность к продукции провоспалительных цитокинов.

Для цитирования: Курбанов М.К. При остром гнойном среднем отите продуцентами провоспалительных цитокинов среди Т-лимфоцитов являются как цитотоксические CD8+, так и хелперные CD4+ клетки.

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CYTOKINE PROFILE IN CHILDREN WITH ACUTE OTITIS MEDIA DEVELOPING AGAINST THE BACKGROUND OF DIABETES MELLITUS

Abstract: The most important function of proinflammatory cytokines is their involvement in mediating interactions between lymphocytes and macrophages, as well as regulating the balance between cellular and humoral components of the immune response. Th1 cells are the main producers of proinflammatory cytokines, whereas Th2 cells reduce the secretory activity of cells. Thus, proinflammatory cytokines are the main mediators of the cellular immune response and inhibitors of the humoral immune response, playing an important role in immunoregulation.

Keywords: during the differentiation of Th1 and Th2 cells, only Th1 cells retain the ability to produce proinflammatory cytokines.

For citation: Kurbanov M.K. In acute purulent otitis media, the producers of anti-inflammatory cytokines among T lymphocytes include both cytotoxic CD8+ cells and helper CD4+ cells.

Введение

Иммунно-опосредованные механизмы также играют значительную роль в формировании сахарного диабета у детей, в частности изменения в состоянии цитокинового профиля, которые при преобладании воспалительного процесса провоцируют иммунные реакции, что позволяет рассматривать их в качестве «маркеров» [1].

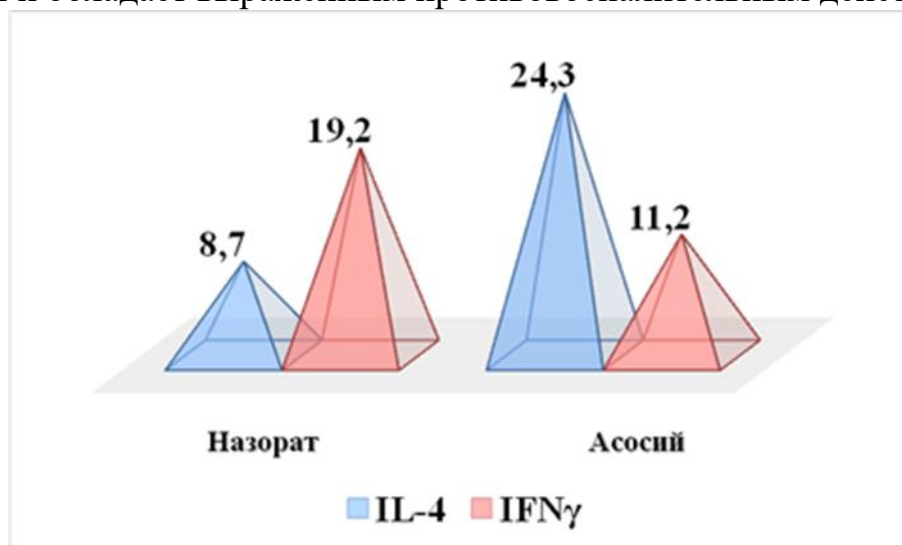
В настоящее время цитокины рассматриваются как новая самостоятельная система регуляции основных функций организма, прежде всего связанных с внедрением патогенов и поддержанием гомеостаза при нарушении целостности тканей. Как известно, цитокины представляют собой группу полипептидных медиаторов, участвующих в формировании и регуляции защитных реакций организма. Изучение уровня цитокинов предоставляет информацию о функциональной активности иммунокомпетентных клеток различных типов, степени выраженности воспалительного процесса, его переходе на системный уровень и прогнозе заболевания, а также позволяет оценить процессы активации Т-хелперов 1-го и 2-го типов [2].

Оценка уровня цитокинов, в частности с использованием иммуноферментных диагностических тест-систем, позволяет в клинической практике по-новому подойти к изучению состояния иммунной системы организма [3].

Воспалительный процесс сопровождается активацией противовоспалительных цитокинов, которые контролируют развитие воспаления. Такие цитокины, как IFN- γ и IL-4, участвуют в регуляции специфического иммунного ответа, определяя амплитуду и продолжительность воспалительных и иммунных реакций [4,6].

Основными источниками IFN- γ являются активированные Т-лимфоциты и натуральные киллеры. Среди Т-лимфоцитов продуцентами противовоспалительных цитокинов являются как цитотоксические CD8+-клетки, так и хелперные CD4+-клетки. Однако при их дифференцировке в Th1 и Th2 только Th1-клетки, участвующие в воспалительной реакции, сохраняют способность к продукции цитокинов. Наиболее важной функцией провоспалительных цитокинов является их участие в опосредовании взаимодействия между лимфоцитами и макрофагами, а также регуляция соотношения клеточных и гуморальных компонентов иммунного ответа. Th1-клетки являются основными продуцентами провоспалительных цитокинов, тогда как Th2-клетки снижают секреторную активность клеток [5,8]. Таким образом, провоспалительные цитокины выступают ключевыми медиаторами клеточного иммунного ответа и ингибиторами гуморального иммунного ответа, играя важную роль в процессах иммунорегуляции.

IFN- γ описывается как фактор, стимулирующий В-лимфоциты, поскольку он вызывает увеличение их количества. Основными продуцентами IL-4 являются Т-хелперы 2-го типа (Th2). IL-4 также синтезируется тучными клетками и клетками, ориентированными на В-клеточный иммунный ответ. IL-4 снижает функциональную активность макрофагов и секрецию ими IL-1, TNF и IL-6, проявляя выраженный противовоспалительный эффект. Таким образом, IL-4 является основным цитокином Th2-клеток и стимулирует их дифференцировку. Он индуцирует дифференцировку В- и Т-лимфоцитов, влияет на развитие кроветворных клеток, макрофагов, натуральных киллеров и базофилов, являясь функциональным антагонистом цитокинов, продуцируемых Th1-клетками. IL-4 способствует развитию аллергических реакций и обладает выраженным противовоспалительным действием [6].



Нами был изучен характер противовоспалительных цитокинов и провоспалительной реакции у детей с острым гнойным средним отитом (ОГСО), развившимся на фоне сахарного диабета. Полученные данные представлены на рисунке 4.6.

Рисунок 4.6. Уровни провоспалительных и противовоспалительных цитокинов у обследованных детей, пг/мл ($R \leq 0,05$).

Мы исследовали выраженность воспалительного процесса у детей с ОГСО, развившимся на фоне клинически выраженного сахарного диабета, и изучили профиль противовоспалительных цитокинов. Анализ полученных результатов выявил достоверные различия между показателями контрольной группы и детьми основной группы [9,10].

Так, уровень IFN- γ у здоровых детей в среднем составлял $19,2 \pm 5,38$ пг/мл, тогда как у детей основной группы данный показатель был равен $11,2 \pm 2,07$ пг/мл. Таким образом, у детей основной группы уровень IFN- γ был снижен в 1,71 раза, что свидетельствует о выраженности воспалительного процесса ($R \leq 0,05$). Несмотря на общее снижение среднего уровня IFN- γ у детей основной группы по сравнению с контрольной, в отдельных случаях отмечалось повышение секреции данного цитокина, что наблюдалось примерно у 4 % обследованных детей [18,22].

При изучении уровня IL-4 у детей контрольной группы он составлял $8,7 \pm 1,65$ пг/мл, тогда как у детей основной группы — $24,3 \pm 5,72$ пг/мл. При этом отмечалось достоверное повышение уровня противовоспалительного цитокина IL-4 в 2,79 раза ($R < 0,05$). У детей с ОГСО, развившимся на фоне сахарного диабета, выявлялась сывороточная воспалительная реакция, а изменения в составе и соотношении противовоспалительных цитокинов подтверждают продолжающееся течение воспалительного процесса [23,26].

Таким образом, клиническое течение и проявления заболевания у детей с ОГСО, развившимся на фоне сахарного диабета, характеризуются выраженным снижением показателей клеточного и гуморального иммунитета, а также достоверным повышением уровня противовоспалительных цитокинов, являющихся основными регуляторами острого воспаления. Обобщение полученных результатов позволяет сделать вывод о том, что ОГСО, развившийся на фоне сахарного диабета, имеет собственные клинико-лабораторные особенности, принципиально отличающиеся от течения ОГСО у детей без сахарного диабета, и характеризуется менее выраженной клинической симптоматикой воспаления среднего уха.

Использованные источники:

1. Вохидов Н. Х. Интерпретация лейкограммы при остром гнойном среднем отите у детей грудного возраста // Вестник оториноларингологии. – М., 2002. – № 6. – С. 48–49.
2. Вохидов Н. Х. Особенности распространения острого среднего отита у детей в зависимости от сезона года в г. Бухаре // Врач общей практики. – Самарканд, 1999. – № 2. – С. 67–68.
3. Вохидов Н. Х. Особенности функционального состояния показателей эритроцитарной системы в клинике острых средних отитов у детей раннего возраста // Вестник врача общей практики. – Самарканд, 1999. – № 4. – С. 15–16.
4. Вохидов Н. Х. Разновидности микрофлоры в клинике гнойных средних отитов у детей // Вестник врача общей практики. – Самарканд, 1999. – № 3. – С. 21–22.
5. Вялкова А. А., Савельева Е. В., Кулагина Е. П. Заболевания органов мочевой системы у детей с сахарным диабетом 1 типа в Оренбургской области // Педиатрия. Российский вестник перинатологии и педиатрии. – М., 2015. – Т. 60, № 4. – С. 201.
6. Гаращенко Т. И., Богомилский М. Р., Радциг Е. Ю. Применение мукоактивных препаратов при заболеваниях верхних дыхательных путей и среднего уха // Материалы Российской научно-практической конференции (19–20 ноября 2002 г.). – М., 2002. – С. 37–38.
7. Григорьев К. И., Григорян А. К., Запруднов А. М. Отипакс в лечении острого среднего отита у детей // Педиатрия. Российский вестник перинатологии и педиатрии. – М., 2000. – № 2. – С. 45–48.

8. Даминов Т. А., Туйчиев Л. Н., Таджиева Н. У., Хамраева В. Ш. Роль инфекции в развитии острого гнойного среднего отита у детей // Медицинский журнал Узбекистана. – Ташкент, 2015. – № 2. – С. 81–84.
9. Нарзуллаев Н. У., Курбанов М. К. Клинические и иммунологические особенности течения острого среднего отита у детей с сахарным диабетом 1 типа // Journal of Advanced Zoology. – 2023. – Т. 44. – С. 282–286.
10. Древаль А. В., Римарчук Г. В., Лосева В. А., Редькин Ю. А. Распространённость сахарного диабета у детей и подростков Московской области // Проблемы эндокринологии. – 2007. – № 2. – С. 3–5.
11. Енин И. В., Енин И. П., Карпов В. П. Профилактика стойкой тугоухости у больных острым средним отитом // Вестник оториноларингологии. – М., 2007. – № 1. – С. 26–28.
12. Курбанов М. К. Иммунологические особенности острого среднего отита у детей с сахарным диабетом 1 типа // A New Day in Medicine. – 2024. – № 7 (69). – С. 417–421.
13. Курбанов М. К. Развитие сахарного диабета 1 типа на фоне прогрессирующего среднего отита: клинические, лабораторные и инструментальные исследования // Yangi Kun Tibbiyoti. – Бухара, 2025. – № 1 (75). – С. 513–516.
14. Нуров У. И., Курбанов М. К. Биологические, иммунологические и экологические аспекты среднего отита // Eurasian Journal of Otorhinolaryngology – Head and Neck Surgery. – 2024. – № 3 (3). – С. 51–55.
15. Нуров У. И., Курбанов М. К. Сахарный диабет у детей и его роль в развитии среднего отита // Eurasian Journal of Otorhinolaryngology – Head and Neck Surgery. – 2024. – № 3 (3). – С. 56–60.
16. Курбанов М. К. Клиника острого среднего отита у детей на фоне сахарного диабета 1 типа // European Journal of Modern Medicine and Practice. – 2023. – Т. 2, № 12. – С. 255–257.
17. Нарзуллаев Н. У., Курбанов М. К. Клиническое течение острого среднего отита у детей с сахарным диабетом 1 типа // Eurasian Research Bulletin. – 2023. – Т. 18. – С. 136–138.
18. Нарзуллаев Н. У., Курбанов М. К. Особенности клинического течения острого среднего отита у детей с сахарным диабетом 1 типа // Eurasian Research Bulletin. – 2023. – Т. 18. – С. 112–114.
19. Курбанов М. К. Иммунологические свойства острого среднего отита у детей с сахарным диабетом 1 типа // Research Journal of Trauma and Disability Studies. – 2024. – С. 945–950.
20. Курбанов М. К. Показатели иммунной системы при среднем отите у детей, развившемся на фоне сахарного диабета // Journal of Science in Medicine and Life. – 2024. – С. 5–7.
21. Курбанов М. К. Изменения иммунной системы при остром вторичном гнойном среднем отите у детей, развившемся на фоне сахарного диабета // Scientific Journal of Applied and Medical Sciences. – 2024. – № 2. – С. 109–111.

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**ДИАБЕТИЧЕСКАЯ ПОЛИНЕЙРОПАТИЯ У
ПОСТМЕНОПАУЗАЛЬНЫХ ЖЕНЩИН: АКТУАЛЬНЫЕ КЛИНИКО-
ПАТОГЕНЕТИЧЕСКИЕ АСПЕКТЫ
(ОБЗОР ЛИТЕРАТУРЫ)**

***Аннотация.** Сахарный диабет является одной из наиболее значимых современных медицинских проблем, масштабы которой продолжают увеличиваться, затрагивая практически все возрастные группы населения. Несмотря на высокую распространенность нарушений опорно-двигательного аппарата у женщин с сахарным диабетом в постменопаузе, у большинства пациенток отмечаются как объективные, так и субъективные проявления остеопатии, однако данные о их характере и частоте остаются противоречивыми.*

***Ключевые слова:** сахарный диабет, диабетическая полинейропатия, климактерический возраст.*

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**DIABETIC POLYNEUROPATHY IN POSTMENOPAUSAL
WOMEN: CURRENT CLINICAL AND PATHOGENETIC ASPECTS
(Literature Review)**

***Abstract.** Diabetes mellitus is one of the most significant modern medical problems, the scale of which continues to grow, affecting virtually all age groups. Despite the high prevalence of musculoskeletal disorders in postmenopausal women with diabetes, most patients experience both objective and subjective manifestations of osteopathy. However, data on their nature and frequency remain contradictory.*

***Keywords:** diabetes mellitus, diabetic polyneuropathy, climacteric age.*

Диабетическая полинейропатия (ДПН) является одним из частых осложнений сахарного диабета (СД) и составляет около 70-75% случаев поражения периферической нервной системы [1,12,15]. У пациентов с вновь,

т.е. впервые выявленным СД 2 типа дистальная симметричная полинейропатия выявляется и устанавливается у 7,5-10% пациентов [18,23].

Важно отметить, учитывая медленное и скрытое течение СД у некоторых пациентов приводит к развитию бессимптомной ДПН, которая проявляется уже на тяжелой стадии с развитием вплоть до гангрены стопы, иногда слепоты, и конечно же смертности. При осмотре пациентов с СД, имеющих ДПН не все жалуются на болевой синдром, и в связи с чем не всегда на это обращается внимание. В связи с чем необходимо уделять особое внимание такому контингенту лиц, проведение скрининг диагностики на наличие ДПН [8,17].

По результатам проведенных в крупных группах амбулаторных пациентов с СД, выявлено, что такие осложнения как “выраженная распространенность тяжелого сенсорного дефицита, который приравнивался 12% и сравнительно наименьшая выявляемость болевой формы ДПН, которая констатировалась в 6,4% случаях” [2,5,16]. Изученные различные данные международных экспертов, а также российских ученых выявило расхождение по статистике встречаемости СД и ДПН. Это может быть разъяснено целым рядом факторов, таких как: возрастной аспект исследуемой группы, гендерные различия, позднее обнаружение СД 1 и 2 типов, поздняя диагностика, разнообразие диагностических методик и критериев постановки диагноза ДПН [6,9].

Клинически при осмотре часто выявляется симметричная сенсомоторная полинейропатия, которая сопровождается болевым синдромом. По клинической классификации принято разделять нейропатическую боль на безболевою и болевую формы, в зависимости от присутствия или отсутствия болевого синдрома [12,13,17].

В клинике безболевого течения ДПН отчаются минимальные симптомы, болевой синдром не выраженный, по характеру имеет медленное развитие, развитие сенсомоторного дефицита считается медленным и постепенным. Субъективные жалобы этой категории пациентов различные. Если рассматривать суточный гликемической профиль, его колебания амплитуды в течении дня, то можно обнаружить связь проявления болевого синдрома с уровнем гипергликемии [17,18,19]. В большинстве случаев болевому синдрому параллельно присоединяются и сенсорные нарушения [10,11,21].

При проведении неврологических тестов часто выявляется, что при нормальных результатах обнаруживаются признаки болевого синдрома, сопровождающегося характерными признаками автономной дисфункции. Предположением этого результата является мозаичное поражение более тонких сенсорных нервных волокон, т.е. происходит избирательное поражение дистальных волокон нервов.

Поражение вегетативной нервной системы характеризуется развитием недостаточного обеспечения вегетативной деятельности, которое сопровождается возникновением ортостатической гипотонии у пациентов

СД, также тахикардией покоя, возникших из-за поражения миелиновых волокон. При рассмотрении острой болевой форме ДПН выявляются гиперпатия и аллодиния, которые выражаются более интенсивнее, нежели при хронической. Клинически при возникновении эпизода стадии декомпенсации СД у пациентов развиваются субъективные жалобы на бессонницу, тяжелый болевой синдром, анорексию, также возникает тревожный и депрессивный синдромы, это все связано с развившейся гипергликемией, которая в свою очередь приводит к развитию сильного похудения пациентов [15,18].

В естественных условиях в женском организме различают периоды. Это наступление менструального цикла, затем переходит в репродуктивный период, от которого плавно переходит в период климакс и далее к старости – менопаузы. Сначала в организме женщины постепенно прекращается репродуктивная фаза, она происходит с угасанием функции яичников, затем прекращаются менструации, это все происходит в течении жизни с возрастом. Начинают преобладать возрастные изменения, т.е. инволюция в репродуктивной системе. Сначала угасает репродуктивная функция, после гормональная функция, что показывает прекращение фертильной функции [9,14].

Научная концепция В.М. Дильмана (2012) подтверждает, что “климактерический период является одновременно и нормой, и болезнью: нормой потому, что климактерий в женском организме - явление закономерное, а болезнью, потому что это стойкое нарушение регуляции, приводящее в конечном итоге к снижению жизнеспособности организма” [1,9,10].

Климактерий более широкое понятие, обозначающее наступление менопаузы, которое является переходным периодом в жизни каждой женщины. Возникает дефицит эстрогенов из-за снижения функции яичников, т.е. возникает дефицит эстрогенов в организме женщины. Это все развивается из-за возникновения нейроэндокринных изменений, которые с возрастом проявляются дисбалансом функции гипоталамо-гипофизарной, а также ретикуло-лимбических систем, что приводят к снижению секреции нейрогормонов из этих областей. С наступлением менопаузы бурно меняется синтез, выброс и активность нейротрансмиттеров, которые регулируют пластичность и синаптические связи нейронов в головном мозге. В организме женщины происходит понижение допаминергической активности и наоборот увеличение норадренергической активности, это в первую очередь связано с пониженной функцией опиодергической системы, которая регулируется происходящими нейроэндокринными механизмами в гипоталамо-гипофизарном и лимбическом отделе головного мозга.

Менопауза не является специфическим заболеванием, но приводит к нарушению эндокринного баланса в женском организме, вызывая повышенный риск развития кровотечений, тошноты, рвоты, бессонницы,

урогенитальных нарушений (сухость, циститы), а также остеопороза и сердечно-сосудистых заболеваний [3,12,17].

По данным различных авторов, нейровегетативные, психоэмоциональные и метаболические нарушения наблюдаются у 10-75% женщин в период менопаузы [3,6,22]. Психоэмоциональное расстройство у женщин с ДПН с климактерическим синдромом (КС) значимо и достигает 50-70% случаев, что составляет по данным литературы [7,16,21].

Коррекция, прогноз, диагностика, профилактика климактерических расстройств с психогенными симптомами является одной из актуальных проблем и на сегодняшний день остаётся до конца не изученной проблемой [18].

У.В. Столярова (2013) в своем исследовании показывает, что психосоматические проявления, возникающие у женщин в климактерическом периоде, имеют сложную диагностику и методы их коррекции, которые на сегодняшний день являются одним из важных вопросов в жизни каждой женщины [6,7].

Учитывая тот факт, что в женском организме до наступления менопаузы возникает пременопаузальный период, т.е. период возникновения климактерических нарушений, для проведения заместительной гормональной терапии (ЗГТ) имеются ряд показаний и противопоказаний к их назначению, а также возможность появления побочных действий и различных осложнений, которые могут возникать при приеме препаратов данной группы, так как назначение препаратов подбирается строго индивидуально, то возникает необходимость для дальнейшего поиска современных высоко эффективных и безопасных препаратов для лечения этих расстройств, а также необходимо разработать методы профилактики и конечно же методы терапии психосоматических, психовегетативных расстройств, возникающих в климактерический период [17].

Проведенный анализ литературных источников показывает то, что климактерический период характеризуется расстройством различного вида проявления психосоматического статуса в различных формах и степенях. Это конечно же влияет на диагностические мероприятия менопаузальных нарушений, а также на тактику ведения пациентов с данным заболеванием [12].

С. А. Ярман (2008) в своей статье «Современные представления о гормональных изменениях у женщин при физиологическом течении болезни в пременопаузальном периоде» заключает, что перименопауза, которая включает три фазы: пременопауза, менопауза и двухлетняя постменопауза, представляет большой интерес для исследователей и клиницистов. В этот период различные клинические проявления приводят к возрастным метаболическим изменениям, сопровождающимся обширными изменениями эндокринного статуса, соматической патологии и характеристик психоэмоционального ответа. В то же время для физически здоровых женщин

характерно физиологическое или «специфическое» течение климактерического периода.

Патологический или «осложненный» (комбинированный) климакс чаще встречается у женщин с сопутствующей экстрагенитальной патологией [18, 20].

На вопрос, почему физиологический процесс часто провоцирует развитие патологического процесса, пока нет однозначного ответа. Известно, что формирование представления о физиологических и патологических параметрах женской репродуктивной системы в процессе старения позволяет единообразно и эффективно разрабатывать методы коррекции различных системных нарушений в данный период.

Т. А. Тарицина (2006) в своем исследовании приходит к выводу, что климактерический период чрезвычайно уязвим для воздействия психогенных травмирующих факторов, ведущих к развитию неврологических расстройств, и является наиболее важным этапом в личности женщины. Психогенное расстройство у пациенток в период климакса проявляется в виде депрессивных реакций и адаптационных (адаптационных) нарушений к стрессу, смешанной панической депрессии в виде соматических и конверсионных расстройств [11,19]. Среди наблюдаемых пациентов выявлены психогенные причины психических расстройств в климактерическом периоде лица с особенностями ($P < 0,001$): преобладают смешанное панико-депрессивное расстройство у женщин с акцентуационным характером сенсорных ощущений, расстройство соматической формы с эпилептиодом, стероидное и неистовое эпилептоидное конверсионное расстройство. Люди без четкой акцентуации чаще испытывают депрессивную реакцию на стресс и адаптивные нарушения.

В своих исследованиях Т.В. Бугрим (2013) указывает на то, что если у женщины выявлен остеопороз и имеются клинические симптомы ишемической болезни сердца, то необходимым и одним из главных считается опрос анамнеза заболевания, который в свою очередь дает возможность постановки степени тяжести течения климактерического синдрома. В ходе исследования было установлено, что клинические проявления ишемической болезни сердца, постменопаузального остеопороза и климактерического синдрома, имеют прямую корреляцию с началом развития самого климакса, его степени тяжести и клиническими проявлениями климактерического периода [5,6,11,20]. Результаты данного исследования делают вывод, что все перечисленные проявления взаимосвязаны, необходимо разработать лабораторные маркеры диагностики данного состояния и должны учитываться при выборе адекватной терапии.

Использованные источники:

1. Аль-Замиль М.Х. Сахарный диабет и диабетическая невропатия: исторический аспект / М.Х. Аль-Замиль, О.В. Кочетова // Клиническая неврология. 2019. - № 3. - С. 45-47.

2. Аметов А.С. Перспективы лечения диабетической нейропатии фокус на фенофибраты / А. С. Аметов, М. А. Лысенко // Сахарный диабет. -2018.-№2. - С. 70-74.
3. Барсуков И.Н. Комплексная терапия алгических форм диабетической полиневропатии / И. Н. Барсуков, Г. О. Андреева, А. Ю. Тарасов // Мед.-биол. и социально-психол. проблемы безопасности в чрезвычайных ситуациях. 2020. - № 1. - С. 43-45.
4. Бегма А.Н. Патогенетические аспекты лечения дистальной периферической полиневропатии у больных сахарным диабетом /А.Н. Бегма, И.В. Бегма // Фарматека. 2021. - № 3. - С. 56-59.
5. Вишнякова Т.М. Аутоантитела к основному белку миелина у детей с диабетической полинейропатией / Т. М. Вишнякова // Сиб. мед. журн.2010. Т. 55, № 6. - С. 50-52.
6. Воронцова А.В., Звычайный М.А. Ткане-селективный модулятор эстрогенной активности - адекватность «альтернативы» гормональной терапии в постменопаузе // Уральский медицинский журнал. 2023. № 4. С. 16-21.
7. Галстян Г.Р. Диабетическая нейропатия: этиология, патогенез, особенности клинического течения и лечение: дис. д-ра мед. наук / М., 2016. - 210 с.
8. Геворкян, М.А. Метаболический гомеостаз у пациенток с климактерическим синдромом на фоне гормональной терапии // Вопр. гинекол., акушерства и перинатол. 2019. - Т. 9, № 2. - С. 44-49.
9. Григорян, О.Р., Андреева Е.Н. Менопаузальный синдром у женщин с нарушениями углеводного обмена. Альтернативные и дополнительные методы терапии в климактерии //Гинекология. - 2021. - № 3. - С. 4-7.
10. Данилова Л.И., Ярошевич Н.А. Сахарный диабет и его осложнения. Клинические варианты диабетической нейропатии. - Минск, 2020. - С. 37-54.
11. Жулев С.Н. Клинико-электрофизиологические критерии дифференциальной диагностики иммунодефицитных и диабетических полиневропатий // Проблемы мед. микологии. 2021. - Т. 10, № 4. - С. 13-17.
12. Закраева А.Г., Кожемякина Е.В., Лесняк О.М. Остеопороз, депрессия и переломы. Современные аспекты проблемы. Остеопороз и остеопатии. 2022; 3:25-31.
13. Исмаилов С. И., Ходжамбердиева Д. Ш., Рихсиева Н. Т. Остеопороз и низкоэнергетические переломы шейки бедра как осложнение различных эндокринных заболеваний // МЭЖ. 2023. №5 (53). С. 115.
14. А.С., Лепшокова АБ, Меньшикова Т.Б., Ахкубекова Н.К., Черевашенко Л.А., Маллаева Р.М. Исследование кальций-фосфорного обмена при остеоартрозе с сопутствующим остеопеническим синдромом у женщин в состоянии менопаузы. Вестник Авиценны. 2019;19(4):520-3.
15. Кузнецова И.В. Бурчаков Д.И. Возможности терапии климактерических симптомов с помощью препаратов мелатонина // Гинекология. 2019; 17 (5): 44-8.

16. Лапочкина Н.П., Маташева А.В., Крупенина Е.А. Селективные ингибиторы обратного захвата серотонина при климактерическом синдроме // Вестник Ивановской медицинской академии. 2019; 20 (4): 34-8.
17. Майчук, Е.Ю. Менопаузальный метаболический синдром и риск развития заболеваний сердечно-сосудистой системы у женщин с хирургической менопаузой // Проблемы женского здоровья. - 2021. - Т. 6. - № 4. - С. 72.
18. Матвеев Н.В. Оценка клинко-экономической эффективности фармакотерапии диабетической полиневропатии // Фарматека. 2021. -№ 19.- С. 107-111.
19. Мухамедова И.Г, Раззоков А.А, Курбанова Р.Т. Применение Кальций Д-3 Никомед в лечении постменопаузального остеопороза с остеоартроза-ми. Медицина Кыргызстана. 2022; 4:280-1.
20. Недосугова Л.В. Патогенез, клинические проявления, подходы к лечению диабетической полинейропатии // Медицинский совет. 2019. №12. С. 43–49.
21. Наджмитдинов О. Б. результаты лабораторных данных некоторых цитокинов на развитие хронической ишемии мозга у пациентов с сахарным диабетом 2 типа //Экономика и социум. – 2022. – №. 11-2 (102). – С. 540-543.
22. Наджмитдинов О. Б., Набиев Р. Р., Шокиров Ш. Т. ИСПОЛЬЗОВАНИЕ КОМПЬЮТЕРНОЙ ТОМОГРАФИИ ПРИ ДИАГНОСТИКЕ ЗАБОЛЕВАНИЙ СЕЛЕЗЁНКИ //Экономика и социум. – 2022. – №. 12-1 (103). – С. 784-788.
23. Раззоков А.А., Салимов НФ, Саидов ДМ, Назаров ИР. Организация оказания медицинской помощи, особенности течения, диагностики и комплексного лечения системного остеопороза. Здравоохранение Таджикистана. 2018;1. – С. 24-30.
24. Самойлова Ю. Г. Исследование головного мозга у пациента с сахарным диабетом 1-го типа с использованием методик магнитно-резонансной томографии // Бюллетень сибирской медицины. – 2019. - №5. - С. 106-111.
25. Строков И.А., Проноза В. В. Медикаментозная терапия невропатической боли // Фарматека. 2019. - № 8. - С. 50-55.
26. Техонин В.П., Лебедев С.В., Рябухин И.А. и др. Селективное накопление моноклональных антител к нейроспецифической енолазе в ткани мозга крыс с окклюзией средней мозговой артерии // Бюл. эксперим. биологии и медицины. 2020. Т. 138, № 10. С. 388—392.
27. Юренева С. В., Ермакова Е. И., Павлович С. В. и соавт. Ведение женщин с менопаузальными расстройствами. Учебное пособие. Геотар-Медиа. 2020. 23-26.

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**КЛИНИКО-МОНИТОРИНГОВЫЙ ПОДХОД К ЛЕЧЕНИЮ
ХРОНИЧЕСКОГО ТАЗОВОГО БОЛЕВОГО СИНДРОМА У ЖЕНЩИН
С ГИНЕКОЛОГИЧЕСКИМИ ЗАБОЛЕВАНИЯМИ
(ЛИТЕРАТУРНЫЙ ОБЗОР)**

***Аннотация.** Хронический синдром тазовой боли является одной из наиболее актуальных и часто встречающихся проблем в структуре женской заболеваемости, особенно у пациенток с гинекологической патологией. Данное состояние оказывает выраженное негативное влияние на качество жизни, сопровождаясь снижением физического функционирования и нарушениями психоэмоционального состояния, что обуславливает необходимость комплексного и междисциплинарного подхода к вопросам диагностики и лечения.*

***Ключевые слова:** боль, синдром тазовой боли, поиорганные дисфункции.*

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**A CLINICAL MONITORING APPROACH TO THE TREATMENT
OF CHRONIC PELVIC PAIN SYNDROME IN WOMEN WITH
GYNECOLOGICAL DISEASES
(Literature review)**

***Abstract:** Chronic pelvic pain syndrome is one of the most pressing and common problems in female morbidity, especially in patients with gynecological pathologies. This condition has a significant negative impact on quality of life,*

accompanied by a decrease in physical functioning and disturbances in psycho-emotional state, which necessitates a comprehensive and interdisciplinary approach to diagnostics and treatment.

Keywords: *pain, pelvic pain syndrome, organ dysfunction.*

По данным многочисленных исследований, в 60–80 % случаев синдром хронической тазовой боли (ХТБ) у женщин имеет гинекологическую этиологию, при этом ведущая роль отводится эндометриозу, хроническим воспалительным заболеваниям органов малого таза, спаечному процессу и тазовой венозной конгестии (Howard F.M., 2019; Zondervan K.T. et al., 2020).

Эндометриоз в настоящее время рассматривается как одно из ключевых заболеваний, ассоциированных с формированием ХТБ. Согласно работам Giudice L.C. и Као L.C. (2020), хроническое воспаление, ангиогенез и нейроинвазия эндометриоидных очагов создают условия для персистирующей болевой импульсации. Аналогичные данные представлены в обзоре Vercellini P. et al. (2022), где подчёркивается роль локального нейровоспаления и периферической сенситизации.

Современные исследования указывают, что в патогенезе ХТБ важную роль играет центральная сенситизация, при которой болевой синдром поддерживается независимо от выраженности органического поражения. По данным Woolf C.J. (2021), длительная ноцицептивная стимуляция приводит к функциональной перестройке спинномозговых и супраспинальных структур, в результате чего неболевые стимулы начинают интерпретироваться как болевые. Это положение подтверждено клиническими наблюдениями Stratton P. и Berkley K.J. (2020). Целью настоящего литературного обзора является анализ современных данных о причинах формирования синдрома хронической тазовой боли, обоснование критериев объективной оценки болевого синдрома и рассмотрение эффективных алгоритмов персонифицированного подхода к лечению.

В клинической практике широко используется понятие «триады ХТБ», включающей три ведущих симптома. Диспареуния наиболее характерна для пациенток с наружным генитальным эндометриозом, особенно при локализации очагов в области крестцово-маточных связок и позадишеечного пространства, а также при спаечном процессе и хроническом сальпингоофорите [2,4]. Дисхезия обусловлена нарушением координации мышц тазового дна и анальных сфинктеров и чаще наблюдается при глубоких инфильтративных формах эндометриоза и выраженном спаечном процессе. Дизурические расстройства нередко сопровождают наружный и внутренний генитальный эндометриоз, а также интерстициальный цистит [1,7,8].

Ряд авторов подчёркивают мультифакторную природу ХТБ. Так, Lamvu G. et al. (2021) указывают, что синдром хронической тазовой боли формируется при сочетании иммунных, эндокринных и нейровегетативных нарушений, усугубляемых психоэмоциональными факторами. Однако при

этом органическая патология органов малого таза остаётся ведущим пусковым механизмом заболевания.

К основным причинам ХТБ у женщин относят:

1. Спаечный процесс, возникающий вследствие воспалительных изменений и сопровождающийся натяжением тканей, нарушением микроциркуляции и развитием болевого синдрома [5,6].

2. Неопластические процессы, при которых объемные образования оказывают компрессионное воздействие на окружающие структуры, вызывая боли без чёткой локализации.

3. Эндометриоз, характеризующийся формированием эндометриоидных гетеротопий как в области репродуктивных органов, так и экстрагенитально. Циклические изменения в очагах эндометриоза поддерживают хроническое воспаление и болевой синдром [3,8].

4. Варикозное расширение вен малого таза, при котором венозный застой приводит к патологической стимуляции нервных окончаний.

Спаечный процесс малого таза рассматривается как самостоятельный фактор ХТБ. По данным Diamond M.P. и Freeman M.L. (2019), болевой синдром при спайках связан не только с механическим натяжением тканей, но и с нарушением микроциркуляции и иннервации. Неопластические процессы также могут вызывать тазовую боль за счёт компрессии нервных сплетений, что подтверждено исследованиями Nezhat C. et al. (2020).

Особое внимание в последние годы уделяется тазовой венозной конгестии. Согласно работам Phillips D. et al. (2022), венозный застой приводит к хронической гипоксии тканей и патологической стимуляции ноцицепторов, что формирует устойчивый болевой синдром.

В диагностике ХТБ рекомендуется использование валидированных шкал оценки боли. Pain Quality Assessment Scale, по данным Dworkin R.H. et al. (2020), позволяет дифференцировать ноцицептивные и нейропатические компоненты боли, что имеет принципиальное значение для выбора тактики лечения.

Современные клинические рекомендации (ESHRE, 2022; ACOG, 2023) подчёркивают необходимость комплексного обследования пациенток с ХТБ с применением ультразвукового исследования, МРТ, эндоскопических методов и диагностической лапароскопии, которая остаётся «золотым стандартом» в диагностике эндометриоза и спаечного процесса.

Терапия ХТБ, согласно современным концепциям, должна быть персонифицированной и направленной не только на устранение органической патологии, но и на модуляцию болевой чувствительности. По данным Vercellini P. et al. (2022) и Lamvu G. et al. (2021), комбинированный подход позволяет существенно улучшить качество жизни пациенток и снизить частоту рецидивов болевого синдрома

Использованные источники:

1. Howard F.M. Chronic pelvic pain // *Obstetrics and Gynecology*. – 2019. – Vol. 134, № 3. – P. 616–629.

2. Zondervan K.T., Becker C.M., Missmer S.A. Endometriosis // *New England Journal of Medicine*. – 2020. – Vol. 382, № 13. – P. 1244–1256.
3. Giudice L.C., Kao L.C. Endometriosis // *The Lancet*. – 2020. – Vol. 364, № 9447. – P. 1789–1799.
4. Vercellini P., Viganò P., Somigliana E., Fedele L. Endometriosis: pathogenesis and treatment // *Human Reproduction Update*. – 2022. – Vol. 28, № 2. – P. 155–180.
5. Woolf C.J. Central sensitization: implications for the diagnosis and treatment of pain // *Pain*. – 2021. – Vol. 152, № 3. – P. S2–S15.
6. Stratton P., Berkley K.J. Chronic pelvic pain and endometriosis: translational evidence of the relationship and implications // *Clinical Obstetrics and Gynecology*. – 2020. – Vol. 54, № 3. – P. 413–427.
7. Lamvu G., Carrillo J., Ouyang C., Rapkin A. Chronic pelvic pain in women: a review // *American Journal of Obstetrics and Gynecology*. – 2021. – Vol. 225, № 3. – P. 260–272.
8. Diamond M.P., Freeman M.L. Clinical implications of postsurgical adhesions // *Human Reproduction Update*. – 2019. – Vol. 7, № 6. – P. 567–576.
9. Nezhat C., Li A., Falik R. et al. Bowel endometriosis: diagnosis and management // *Fertility and Sterility*. – 2020. – Vol. 114, № 3. – P. 505–517.
10. Phillips D., Deipolyi A.R., Hesketh R.L. Pelvic venous disorders and chronic pelvic pain // *Phlebology*. – 2022. – Vol. 37, № 2. – P. 79–90.
11. Dworkin R.H., Turk D.C., Farrar J.T. et al. Core outcome measures for chronic pain clinical trials: pain assessment // *Journal of Pain*. – 2020. – Vol. 6, № 6. – P. 374–386.
12. ESHRE Endometriosis Guideline Group. Endometriosis: guideline // *Human Reproduction Open*. – 2022. – № 2. – P. 1–26.
13. ACOG Practice Bulletin No. 218. Chronic pelvic pain // *Obstetrics and Gynecology*. – 2023. – Vol. 135, № 3. – P. e98–e109.
14. Наджмитдинов О. Б., Камбарова Д. Н. Применение мультиспиральной компьютерной томографии в диагностике урологических болезней // *Экономика и социум*. – 2024. – №. 1 (116). – С. 1128-1131.
15. Мадаминов О. Р., Наджмитдинов О. Б. роль радиологических исследований при диагностике нарушений в билиарном тракте // *Экономика и социум*. – 2023. – №. 2 (105). – С. 771-775.

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ОСОБЕННОСТИ ИММУНОГИСТОХИМИЧЕСКИХ ИЗМЕНЕНИЙ ЭНДОТЕЛИЯ ЛЁГОЧНЫХ СОСУДОВ В УСЛОВИЯХ ЭКСПЕРИМЕНТАЛЬНОГО САХАРНОГО ДИАБЕТА

***Аннотация:** Сахарный диабет является одним из наиболее распространённых хронических эндокринных заболеваний и сопровождается развитием системных сосудистых нарушений, в том числе микроциркуляторных расстройств в лёгочной ткани, ключевым механизмом которых выступает эндотелиальная дисфункция. В работе представлены результаты экспериментального исследования морфологических и иммуногистохимических изменений эндотелия сосудов лёгких при сахарном диабете, моделированном у лабораторных животных аллоксановым методом. Использование комплекса гистологических, иммуногистохимических и морфометрических методов позволило выявить выраженные деструктивные изменения эндотелиальных клеток, снижение их функциональной активности, повышение проницаемости сосудистой стенки и развитие микроциркуляторных нарушений в лёгочной ткани.*

***Ключевые слова:** Сахарный диабет, экспериментальное моделирование, лёгкие, сосудистый эндотелий, иммуногистохимия, микроциркуляторное русло, сосудистая стенка.*

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OF IMMUNOHISTOCHEMICAL CHANGES IN THE ENDOTHELIUM OF PULMONARY VESSELS UNDER EXPERIMENTAL DIABETES MELLITUS

***Annotation:** Diabetes mellitus is one of the most prevalent chronic endocrine diseases and is associated with the development of systemic vascular disorders, including microcirculatory disturbances in lung tissue, the key pathogenetic mechanism of which is endothelial dysfunction. This study presents*

the results of an experimental investigation of morphological and immunohistochemical alterations in the pulmonary vascular endothelium under conditions of diabetes mellitus modeled in laboratory animals using the alloxan method. The application of a комплекс of histological, immunohistochemical, and morphometric methods made it possible to identify pronounced destructive changes in endothelial cells, a decrease in their functional activity, increased vascular wall permeability, and the development of microcirculatory disturbances in lung tissue.

Key words: *Diabetes mellitus, experimental model, lungs, vascular endothelium, immunohistochemistry, microcirculation, vascular wall.*

Актуальность. Сахарный диабет относится к числу ведущих медико-социальных проблем современной медицины, что обусловлено ростом заболеваемости и высоким риском сосудистых осложнений. Хроническая гипергликемия, приводящая к развитию эндотелиальной дисфункции, является ключевым механизмом формирования диабетических ангиопатий. В связи с развитой микроциркуляторной сетью и участием в синтезе вазоактивных медиаторов особый интерес представляет эндотелий сосудов лёгких. Недостаточная изученность его иммуногистохимических характеристик при сахарном диабете определяет актуальность настоящего исследования.

Цель исследования. Настоящее исследование направлено на анализ морфологических и иммуногистохимических особенностей изменений эндотелиального слоя сосудов лёгких в условиях экспериментально индуцированного сахарного диабета.

Методы исследования.

Эксперимент выполнен на половозрелых крысах линии Wistar (180–220 г), содержащихся с соблюдением санитарно-гигиенических норм и принципов биоэтики. Животные были разделены на контрольную и экспериментальную группы; сахарный диабет моделировали однократным внутрибрюшинным введением аллоксана моногидрата (150 мг/кг), в контрольной группе вводили изотонический раствор натрия хлорида. Уровень гликемии определяли глюкометром, животных с показателями ≥ 14 ммоль/л включали в исследование. Эксперимент завершали на 30-е и 60-е сутки. После эвтаназии лёгкие фиксировали в 10% нейтральном формалине и подвергали стандартной гистологической обработке. Срезы (4–5 мкм) окрашивали гематоксилином и эозином, по Ван-Гизону; иммуногистохимическое исследование проводили с использованием антител к CD31 и eNOS. Морфометрический анализ включал оценку параметров сосудистой стенки и статистическую обработку данных.

Результаты исследования.

В контрольной группе морфологических изменений лёгочной ткани не выявлено, эндотелий сосудов микроциркуляторного русла сохранял структурную целостность. Через 30 суток экспериментального сахарного диабета отмечались ранние признаки эндотелиального повреждения (отёк и

дезорганизация эндотелиальных клеток, утолщение базальной мембраны), а к 60-м суткам — выраженные изменения, включающие утолщение сосудистой стенки, деструкцию эндотелия с десквамацией эндотелиоцитов, эритроцитарный стаз и микротромбообразование. Иммуногистохимически выявлено достоверное снижение экспрессии CD31 и eNOS, сопровождающееся нарушением межэндотелиальных контактов и снижением продукции оксида азота. Морфометрический анализ подтвердил увеличение толщины сосудистой стенки и уменьшение площади сосудистого просвета. Полученные данные свидетельствуют о прогрессирующей эндотелиальной дисфункции лёгочных сосудов при сахарном диабете.

Вывод.

Результаты исследования свидетельствуют о том, что экспериментальный сахарный диабет сопровождается выраженными структурными и иммуногистохимическими изменениями эндотелия сосудов лёгких, проявляющимися повреждением эндотелиальных клеток, снижением экспрессии ключевых функциональных маркеров и прогрессированием микроциркуляторных нарушений. Полученные данные подтверждают ведущую роль сосудистого эндотелия в формировании лёгочных осложнений при сахарном диабете и могут служить морфологическим обоснованием разработки патогенетически ориентированных подходов к профилактике и коррекции диабетических ангиопатий.

Использованные источники:

1. Sobirova, D. R. (2024). CHANGES IN BLOOD VESSEL ENDOTHELIUM AND LUNG TISSUE MORPHOLOGICALLY ASSOCIATED WITH EXPERIMENTAL DIABETES.
2. Собирова, Д. Р., Азизова, Ф. Х., & Ахмедова, Д. Б. (2025). ЭКСПЕРИМЕНТАЛ ДИАБЕТДА ЎПКА ТОМИРЛАРИ ЭНДОТЕЛИЙСИНИНГ ИММУНОГИСТОКИМЁВИЙ ЎЗГАРИШЛАРИ. Журнал гуманитарных и естественных наук, (18), 159-165.
3. Sobirova, D. R. (2025, March). PULMONARY VASCULAR WALL PARAMETERS IN EXPERIMENTAL DIABETES MELLITUS. In Innovate Conferences (pp. 8-9).
4. Собирова, Д. Р., & Усманов, Р. Д. (2024). КАНДЛИ ДИАБЕТ КАСАЛЛИГИДА КОН ТОМИРЛАР ЭНДОТЕЛИЙСИДАГИ МОРФОЛОГИК УЗГАРИШЛАР.
5. Sobirova, D. R., & Usmanov, R. D. (2024). CHANGE OF LUNG TISSUE AND ENDOTHELIUM OF BLOOD VESSELS IN EXPERIMENTAL DIABETES (Doctoral dissertation, Ўзбекистон, Тошкент).
6. Sobirova, D. R. (2025). IMMUNOHISTOCHEMICAL EVALUATION OF PULMONARY MICROVASCULAR ENDOTHELIUM IN ALLOXAN-INDUCED DIABETES. Central Asian Journal of Medicine, (1), 61-68.
7. Ravshanovna, S. D., Djakhangirovich, U. R., & Xusanovna, A. F. (2021). Scientific substantiation of histological changes in the pulmonary endothelium in diabetes.

8. Махмудова, Ш. И., & Хужамуратова, Д. Х. (2025). Морфологические особенности мезентериальных лимфатических узлов в норме и при патологии. PEDAGOG, 8(12), 11-14.
9. Махмудова, Ш. И., & Хужамуратова, Д. Х. (2025). Селезёнка как лимфоидный орган: гистологические характеристики и роль в иммунной системе. PEDAGOG, 8(12), 15-18.
10. Айтеков, Б. М., Батырбеков, Т. М., & Хужамуратова, Д. Х. (2025). Морфогенез и функциональные особенности органов эндокринной и иммунной систем в норме и патологии. Экономика и социум, (10-2 (137)), 1147-1150.
11. Батырбеков, Т. М., Болтабаев, З. Ш., Вохиджонов, Э. Н., & Хужамуратова, Д. Х. (2025). Структурно-функциональные особенности мезентериальных лимфатических узлов при сахарном диабете. Экономика и социум, (11-2 (138)), 749-752.

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КРИТИЧЕСКИЕ СОСТОЯНИЯ В КЛИНИЧЕСКОЙ ДЕРМАТОВЕНЕРОЛОГИИ: СОВРЕМЕННЫЕ ПОДХОДЫ К ДИАГНОСТИКЕ И ТЕРАПИИ

Аннотация: В данной статье представлен комплексный анализ патологических состояний кожи, представляющих непосредственную угрозу жизни. Рассмотрены актуальные эпидемиологические данные, современные взгляды на иммунопатогенез (включая роль гранулизина и цитокинового каскада) и обновленные алгоритмы оказания неотложной помощи, представленные на международном симпозиуме «Dermatology Days of Paris — 2025». Особое внимание уделено дифференциальной диагностике тяжелых лекарственных реакций, некротизирующих инфекций и системных токсических синдромов.

Ключевые слова: токсический эпидермальный некролиз, DRESS-синдром, некротизирующий фасциит, синдром Стивенса-Джонсона, экстренная дерматология.

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CRITICAL CONDITIONS IN CLINICAL DERMATOVENEREOLOGY: MODERN APPROACHES TO DIAGNOSIS AND THERAPY

Abstract: This article presents a comprehensive analysis of pathological skin conditions that pose an immediate threat to life. Current epidemiological data, contemporary concepts of immunopathogenesis (including the role of granulysin and the cytokine cascade), and updated algorithms for emergency care, as presented at the international symposium “Dermatology Days of Paris — 2025,” are reviewed. Particular attention is given to the differential diagnosis of severe drug reactions, necrotizing infections, and systemic toxic syndromes.

Keywords: toxic epidermal necrolysis; DRESS syndrome; necrotizing fasciitis; Stevens–Johnson syndrome; emergency dermatology.

Введение

Дерматовенерология традиционно рассматривается как область амбулаторной медицины, однако существует ряд нозологий, при которых кожа становится основным индикатором системной декомпенсации. Неотложные состояния в дерматологии (emergency dermatology)

характеризуются агрессивным течением, вовлечением значительных площадей кожного покрова (свыше 10–30%) и высоким риском развития полиорганной недостаточности.

Актуальность проблемы в 2025 году обусловлена широким внедрением таргетной и иммуноонкологической терапии, ростом антибиотикорезистентности возбудителей мягких тканей и изменением клинического профиля пациентов на фоне нарастающей коморбидности [1, 2].

ТЯЖЕЛЫЕ КОЖНЫЕ РЕАКЦИИ ГИПЕРЧУВСТВИТЕЛЬНОСТИ (scars)

Спектр эпидермального некролиза: Синдромы Стивенса-Джонсона (ССД) и Лайелла (ТЭН)

Данные патологии представляют собой континуум единого процесса, дифференцируемого по площади отслойки эпидермиса. По этиологическому фактору более 85% случаев ассоциированы с приемом лекарственных средств: сульфаниламидов, аллопуринола и ряда антиконвульсантов [3].

Патофизиология: Современные исследования подтверждают, что ключевым медиатором гибели кератиноцитов является гранулизин — катионный белок, секретируемый цитотоксическими Т-лимфоцитами. Его концентрация в везикулярном экссудате прямо коррелирует с тяжестью поражения и прогнозом выживаемости [4].

Клинические маркеры: Дебют заболевания часто имитирует гриппоподобное состояние с последующим появлением болезненной эритемы («симптом горячей кожи») и положительным симптомом Никольского, свидетельствующим о тотальном нарушении межклеточной адгезии [5].

DRESS-синдром: «Великий имитатор»

DRESS-синдром характеризуется отсроченной манифестацией (до 2 месяцев после начала приема препарата-индуктора). В основе патогенеза лежит сложная синергия между лекарственной специфичностью Т-клеток и реактивацией герпесвирусов (HHV-6, HHV-7, EBV) [6].

Диагностическая триада:

Выраженный отек лица (периорбитальная зона).

Системная лимфаденопатия.

Гематологические аномалии: эозинофилия ($>1500/\text{мкл}$) и атипичный мононуклеоз [7].

Инфекционные дерматологические катастрофы

Некротизирующий фасциит (НФ)

НФ — это жизнеугрожающая бактериальная деструкция мягких тканей, при которой скорость распространения некроза может достигать 2,5 см в час [8]. Выделяют полимикробный (I тип) и мономикробный (II тип, вызванный *Streptococcus pyogenes*) варианты инфекции [9].

Важный признак: Несоответствие между интенсивностью болевого синдрома («разрывающая» боль) и относительно сохранным видом кожи на ранних стадиях является патогномоничным признаком, требующим

немедленной хирургической ревизии. Для оценки рисков рекомендуется использование шкалы LRINEC [10].

Стафилококковый синдром ошпаренной кожи (SSSS)

В отличие от эпидермального некролиза, при SSSS поражение ограничено зернистым слоем эпидермиса за счет действия эксфолиативных токсинов стафилококка. Поскольку мишень токсинов (десмоглеин-1) отсутствует в слизистых оболочках, последние остаются интактными, что служит ключевым дифференциальным признаком [11].

Сосудистые нарушения и пурпура

Молниеносная пурпура (Purpura Fulminans)

Критическое состояние, характеризующееся острым дефицитом естественных антикоагулянтов (протеинов С и S) на фоне сепсиса (чаще менингококковой этиологии). Клинически проявляется симметричными некротическими экхимозами с «географическими» очертаниями [12, 13].

Стратегии терапии и интенсивного ухода

Общие принципы:

Температурный контроль: Поддержание температуры среды 30–32°C для компенсации терморегуляторной функции кожи.

Инфузионная поддержка: Расчет по модифицированным ожоговым формулам при строгом мониторинге диуреза [14, 15].

Фармакологическая коррекция:

Циклоспорин А: В дозе 3–5 мг/кг демонстрирует более высокую селективность в блокировании Т-клеточного каскада по сравнению с традиционными глюкокортикоидами [16].

Прогностические модели

Для стратификации риска летальности применяется шкала SCORTEN. Прогноз варьируется от благоприятного (при 0–1 балле) до критического (>90% смертности при 5 и более баллах) [18]. Пациенты, перенесшие острый период, нуждаются в многолетней реабилитации для коррекции офтальмологических осложнений и психологической травмы [19].

Заключение

Неотложные состояния в дерматологии требуют от врача высокой настороженности. Своевременное распознавание критических маркеров поражения кожи позволяет вовремя инициировать патогенетическую терапию и снизить показатели летальности. В современных условиях кожа выступает не только как объект поражения, но и как зеркало системного гомеостаза организма.

Использованные источники:

1. Hervier B., et al. Immune checkpoint inhibitors and skin toxicity. *Journal of Clinical Oncology*. 2024.
2. Hua C., et al. Emergency Dermatology: a 2025 perspective. *Annals of Dermatology*. 2025.
3. Roujeau J.C. The spectrum of drug-induced skin eruptions. *New England Journal of Medicine*. 2021.

4. Chung W.H., et al. Granulysin is a key mediator for keratinocyte death in SJS/TEN. *Nature Medicine*. 2021.
5. White K.D., et al. SJS/TEN: Early Diagnosis and Management. *JAAD*. 2022.
6. Shiohara T. Virus reactivation in DRESS syndrome. *Journal of Investigative Dermatology*. 2023.
7. Descamps V. DRESS Syndrome: Clinical Management. *Clinical Reviews in Allergy & Immunology*. 2024.
8. Stevens D.L. Streptococcal Toxic Shock Syndrome and Necrotizing Fasciitis. *The Lancet*. 2023.
9. Misiakos E.P. Necrotizing Fasciitis: A Surgical Emergency. *Frontiers in Surgery*. 2024.
10. Wong C.H. LRINEC Score: Validation in a Western Population. *Critical Care*. 2023.
11. Amagai M. Desmoglein 1 and the pathogenesis of SSSS. *Journal of Cell Science*. 2024.
12. Darmstadt G.L. Purpura Fulminans: Pathophysiology. *Pediatrics*. 2024.
13. Join-Lambert O. Meningococcemia and the skin. *Infectious Disease Reports*. 2023.
14. Schneider D.F. Burn care principles in Dermatology. *Journal of Burn Care & Research*. 2024.
15. Fivenson D. Supportive care for SJS/TEN. *Dermatology Clinics*. 2023.
16. Lee H.Y. Cyclosporine in the treatment of TEN. *British Journal of Dermatology*. 2022.
17. Ko T.M. Genetic markers for drug-induced reactions. *Science Translational Medicine*. 2024.
18. Sassolas B. SCORTEN: A retrospective study of 20 years. *Archives of Dermatology*. 2022.
19. O'Reilly P. Long-term sequelae of SJS/TEN. *Ocular Surface*. 2023.
20. European Academy of Dermatology (EADV). Guidelines for management of acute skin failure. EADV Press. 2024.
21. Schwartz R.A. Toxic Epidermal Necrolysis. *eMedicine/Medscape*. Updated 2025.
22. Mockenhaupt M. The epidemiology of severe cutaneous adverse reactions. *Chemical Research in Toxicology*. 2023.
23. Valeyrie-Allanore L. Severe drug eruptions. *La Revue de Médecine Interne*. 2024.
24. French Society of Dermatology. National Consensus on SCARs. 2024.
25. WHO. Global Report on Sepsis and Skin Infections. 2023.
26. Pasternack M.S. Soft Tissue Infections. *Mandell's Principles*. 2024.
27. Harr T. Management of SJS/TEN. *Current Opinion in Allergy and Clinical Immunology*. 2023.
28. Kim H.I. Clinical updates on DRESS. *Yonsei Medical Journal*. 2024.
29. U.S. National Institutes of Health (NIH). Clinical trials in acute skin failure. *ClinicalTrials.gov*. 2025.

30. Zimmermann S. The role of NK cells in SJS/TEN. *Frontiers in Immunology*. 2024.

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SUN'IY INTELEKTNING INSON HAYOTIDAGI O'RNI

Annotatsiya. Ushbu maqolada sun'iy intellekt (SI) texnologiyalarining shakllanish jarayoni, zamonaviy jamiyatdagi o'rni, inson faoliyatining turli sohalariga ta'siri, ehtimoliy xavflari va istiqbollari ilmiy-nazariy jihatdan tahlil qilinadi. Shuningdek, SI ning iqtisodiyot, tibbiyot, ta'lim, transport, xavfsizlik va kundalik hayotdagi integratsiyasi misollar orqali ko'rib chiqiladi. Maqola yakunida sun'iy intellektni boshqarish, etik me'yorlar va inson-SI hamkorligi bo'yicha xulosalar beriladi.

Kalit so'zlar: tibbiyot, iqtisod, transport, istiqbollar, sun'iy, etik, integratsiya, intellekt.

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THE ROLE OF ARTIFICIAL INTELLIGENCE IN HUMAN LIFE

Abstract. In this article, the formation process of artificial intelligence (SI) technologies, their place in modern society, their impact on various areas of human activity, possible risks and prospects are analyzed scientifically and theoretically. Also, the integration of SI in the economy, medicine, education, transportation, security and everyday life is considered through examples. At the end of the article, conclusions are given on the management of artificial intelligence, ethical standards and human-AI cooperation.

Keywords: medicine, economy, transport, perspectives, artificial, ethics, integration, intelligence.

XXI asrning eng muhim texnologik yutuqlaridan biri — sun'iy intellektning jadal rivojlanishidir. Bugungi kunda SI nafaqat texnik tizimlarning ishlashini osonlashtiradi, balki insonning fikrlash, tahlil qilish va qaror qabul qilish jarayonlariga ham bevosita ta'sir ko'rsatmoqda. SI algoritmlarining rivoji, katta ma'lumotlar (big data) va chuqur o'rganish (deep learning) texnologiyalarining paydo bo'lishi insoniyat taraqqiyotiga mutlaqo yangi bosqich olib keldi.

Mutaxassislarning fikriga ko'ra, sun'iy intellektning iqtisodiy, ijtimoiy va madaniy hayotga ta'siri kelgusi o'n yilliklarda yanada ortib boradi. Bu jarayon inson hayoti uchun ulkan imkoniyatlar bilan birga, yangi mas'uliyat, xavf va muammolarni ham keltirib chiqarmoqda. Sun'iy intellekt tushunchasi va uning rivojlanish bosqichlari [1].

Sun'iy intellekt (SI) — bu kompyuter tizimlarining inson aql-zakovati talab qiladigan vazifalarni bajarish qobiliyatidir. Unga o'rganish, muammolarni hal qilish, mantiqiy xulosa chiqarish, nutqni va tasvirlarni tanish, qaror qabul qilish kabi funksiyalar kiradi. SI rivojlanishining asosiy bosqichlari: 1950–1970-yillar – Dastlabki algoritmlar, mantiqiy tizimlar, Turing testi. 1980–1990-yillar – Ekspert tizimlar, qoidaviy modellar. 2000–2010-yillar – Mashinaviy o'qitish, neyron tarmoqlar. 2010–hozirga qadar – Chuqur o'rganish, generativ modellar, katta til modellari. Bugungi kunda SI nafaqat ma'lumotni qayta ishlaydi, balki yangi ma'lumot yaratish, kreativ ishlar bilan shug'ullanish, murakkab jarayonlarni avtomatlashtirish imkoniyatiga ega. Sun'iy intellektning jamiyat hayotidagi o'rni

Iqtisodiyotga ta'siri. SI iqtisodiy jarayonlarni tezlashtirish, samaradorlikni oshirish va xarajatlarni kamaytirishda muhim ahamiyatga ega. Korxonalar SI asosidagi tahliliy tizimlar orqali: bozorni prognoz qiladi, mijozlar xulqini tahlil qiladi, ishlab chiqarishni avtomatlashtiradi, xavflarni boshqaradi [2].

McKinsey tahlillariga ko'ra, SI 2030-yilga borib dunyo iqtisodiyotiga trillionlab dollar qiymat qo'shishi mumkin. Tibbiyotdagi ahamiyati. SI tibbiyotda quyidagilarni amalga oshirmoqda: kasalliklarni erta aniqlash, rentgen va MRT tasvirlarini tahlil qilish, jarrohlikda robot yordamchilardan foydalanish, bemor holatini kuzatish, dori yaratish jarayonini tezlashtirish.

Masalan, SI pnevmoniya, saraton va yurak kasalliklarini aniqlashda ba'zi sohalarida inson mutaxassislariidan ham aniqroq natijalar bermoqda. Ta'lim sohasida SI

Ta'limda SI quyidagi funksiyalarni bajaradi: shaxsga moslashtirilgan o'qitish (personalized learning), avtomatlashtirilgan tekshirish (test, esse, uy vazifalari), virtual o'quv yordamchilari, ko'p tilli tarjima va o'quv materiallarini yaratish. Hozirgi vaqtda an'anaviy ta'lim bilan SI asosidagi adaptiv ta'lim tizimlari birgalikda ishlamoqda. Transport va logistika. SI transport sohasini tubdan o'zgartirmoqda: avtonom avtomobillar va dronlar, yo'l harakatini optimallashtirish, yuk tashishni rejalashtirish, xavfsizlikni oshirish [3].

Kelajakda avtonom transport tizimlari odam ishtirokini minimal darajaga tushirishi kutilmoqda. Maishiy hayotdagi o'rni. Bugungi kundalik hayotda SI keng qo'llanmoqda: ovozli yordamchilar (Siri, Google Assistant), aqlli uy qurilmalari, onlayn taklif va tavsiyalar (YouTube, Netflix), matn, rasm va video

yaratish, bank xizmatlari. Bu tizimlar inson hayotini yengillashtirib, vaqt tejaliishiga xizmat qilmoqda. Sun'iy intellektning ijtimoiy va axloqiy masalalari. SI rivoji bir qator muammolarni ham yuzaga keltirmoqda: Xavfsizlik muammolari. Ma'lumotlar maxfiyligi buzilishi; Kiberhujumlar; Avtonom qurollarning nazoratsiz ishlashi. Ish o'rinlari qisqarishi. Ba'zi sohalarida avtomatlashtirish sababli inson mehnatiga talab kamayib bormoqda. Bu qayta tayyorlash va yangi malakalar olish zaruriyatini tug'dirmoqda. Etik masalalar. SI xolis bo'lishi, qarorlar qabul qilishda adolatsizlikka yo'l qo'ymaslik, algoritmlarning shaffofligi [4]. Deepfake va axborot manipulyatsiyasi

Generativ modellar orqali soxta foto va video yaratish axborot xavfsizligi uchun katta tahdid bo'lib qolmoqda. Sun'iy intellektning kelajagi. Mutaxassislar SI kelajakda quyidagi yo'nalishlar bo'yicha rivojlanishini prognoz qilmoqdalar:

Superintellekt: inson qobiliyatidan yuqori darajadagi SI tizimlarining paydo bo'lishi ehtimoli.

Inson-SI hamkorligi: SI insonning o'rnini bosuvchi emas, balki yordamchi sifatida ishlashi.

Etik me'yorlarning shakllanishi: davlatlar va xalqaro tashkilotlar tomonidan SI politikalarini yaratish.

To'liq avtomatlashtirilgan jamiyat: ishlab chiqarish, transport, xizmat ko'rsatish sohalarining SI orqali boshqarilishi.

Kelajakda SI har bir insonga shaxsiy yordamchi, maslahatchi, tibbiy kuzatuvchi va o'qituvchi bo'lishi kutilmoqda [5].

Xulosa

Sun'iy intellekt inson hayotining deyarli barcha jabhalariga chuqur kirib bormoqda va jamiyat taraqqiyotini yangi bosqichga olib chiqmoqda. U iqtisodiyot samarasini oshiradi, tibbiyotda kasalliklarni aniq tashxislashga yordam beradi, ta'limni individuallashtiradi va maishiy hayotni yengillashtiradi. Shu bilan birga, SI bilan bog'liq xavfsizlik, etik va ijtimoiy muammolarni hal etish insoniyat oldida turgan muhim vazifalardan biridir [6].

SI dan oqilona, mas'uliyatli va etika me'yorlari asosida foydalanish kelajak avlodlar uchun barqaror texnologik muhit yaratishga yordam beradi. Sun'iy intellekt — insonning raqibi emas, balki uning imkoniyatlarini kengaytiruvchi kuchli vosita sifatida qaralishi lozim [7].

Foydalanilgan adabiyotlar.

1. Russell S., Norvig P. *Artificial Intelligence: A Modern Approach*. — Pearson, 2021.
2. Bostrom N. *Superintelligence: Paths, Dangers, Strategies*. — Oxford University Press, 2018.
3. Christopher Bishop — "Pattern Recognition and Machine Learning" ML asoslari: matematik modellar, klassifikatsiya, regressiya, grafik modellar.
4. Kevin Murphy — "Probabilistic Machine Learning" (2 jild) AI ning ehtimollik asoslari, grafik modellar, chuqur o'rganish.
5. Richard Sutton & Andrew Barto — "Reinforcement Learning: An Introduction" Muvaffaqiyatli AI agentlarini yaratish asoslari.

6. “Sun’iy intellekt asoslari” — A.D. Ubaydullaev AI tushunchalari, ekspert tizimlar, neyron tarmoqlar haqida asosiy o‘zbekcha qo‘llanma.
7. Бобонов Д.Т. Электрические свойства и нестабильность тока в кремнии, легированном селеном; Электрические имущество и обслуживание пряжка и силикон легированный селен _ - 2010 г.

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YARIMO'TKAZGICHLI MATERIALLARNING XOSSALARI, TURLARI VA ZAMONAVIY QO'LLANILISH SOHALARI

Annotatsiya. Yarimo'tkazgichli materiallar zamonaviy elektronika, optoelektronika va axborot texnologiyalarining asosiy tayanchi hisoblanadi. Ular elektr o'tkazuvchanligi bo'yicha izolyatorlar va metallarning oralig'ida joylashib, tashqi ta'sirlar — harorat, yorug'lik, elektr maydoni yoki aralashmalar (legirlash) yordamida boshqarilishi mumkin. Shu xususiyati tufayli yarimo'tkazgichlar barcha elektron qurilmalar: tranzistor, diod, mikrosxema, sensor va mikroprotssessorlarning asosini tashkil qiladi. Yarimo'tkazgichlar harorat oshishi bilan o'tkazuvchanligi ortadigan materiallardir.

Kalit so'zlar: qurilma, yorug'lik, izolyator, maydon, harorat, legirlash, yarimo'tkazgich, elektr, tranzistor, mikrosxema.

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PROPERTIES, TYPES AND MODERN APPLICATIONS OF SEMICONDUCTOR MATERIALS

Abstract. Semiconductor materials are the mainstay of modern electronics, optoelectronics and information technologies. They are located between insulators and metals in terms of electrical conductivity, and can be controlled by external influences - temperature, light, electric field or impurities (alloying). Because of this feature, semiconductors form the basis of all electronic devices: transistors, diodes, microcircuits, sensors, and microprocessors. Semiconductors are materials whose conductivity increases with temperature.

Keywords: device, light, insulator, field, temperature, alloying, semiconductor, electricity, transistor, microcircuit.

Yarimo‘tkazgichli materiallar zamonaviy elektronika, optoelektronika va axborot texnologiyalarining asosiy tayanchi hisoblanadi. Ular elektr o‘tkazuvchanligi bo‘yicha izolyatorlar va metallarning oralig‘ida joylashib, tashqi ta’sirlar — harorat, yorug‘lik, elektr maydoni yoki aralashmalar (legirlash) yordamida boshqarilishi mumkin [1]. Shu xususiyati tufayli yarimo‘tkazgichlar barcha elektron qurilmalar: tranzistor, diod, mikrosxema, sensor va mikroprotssessorlarning asosini tashkil qiladi. Yarimo‘tkazgichlar harorat oshishi bilan o‘tkazuvchanligi ortadigan materiallardir. Metallarda esa buning aksi kuzatiladi. Bu xossa ularning energetik strukturasi — valent va o‘tkazuvchanlik zonalariga bog‘liq. **Ichki yarim o‘tkazgichlar:** o‘tkazuvchanlik qattiq moddaning tabiiy tuzilishiga bog‘liq (Si, Ge). **Tashqi yarim o‘tkazgichlar:** legirlash orqali xossasi o‘zgartiriladi. **n-tip:** elektronlar asosiy zaryad tashuvchilar. **p-tip:** teshik (bo‘shliq) zaryad tashuvchilar asosiy rolni o‘ynaydi. Materialning band bo‘shlig‘i qancha kichik bo‘lsa, uning o‘tkazuvchanligi shuncha yuqori bo‘ladi [2]. Masalan:

Si – 1.12 eV

Ge – 0.66 eV

GaAs – 1.43 eV

Bitta elementdan iborat bo‘ladi: Kremniy (Si) – elektron sanoatda eng keng tarqalgan. Germaniy (Ge) – past kuchlanishli qurilmalarda qo‘llaniladi.

Bir necha elementdan tashkil topgan murakkab moddalardir:

Galliy arsenid (GaAs) – yuqori chastotali qurilmalar va lazerlar.

Kadmiiy tellurid (CdTe) – quyosh panellari.

Indiy fosfid (InP) – optik aloqa tizimlari.

Polimer asosidagi yarimo‘tkazgichlar OLED ekranlar, moslashuvchan elektronika va biosensordlarda qo‘llaniladi [3]. Barcha protssessorlar, mikrosxemalar, xotira bloklari va sensorlarning asosida yarimo‘tkazgichlar turadi. Nano texnologiya asosida 3–5 nm li tranzistorlar ishlab chiqarilmoqda. Kremniyli yoki CdTe, GaAs kabi birikmali moddalardan tayyorlangan fotoelektrik panellar yuqori samaradorlikka ega. Ular quyosh nurlarini to‘g‘ridan-to‘g‘ri elektr energiyasiga aylantiradi. LED diodlar, lazer diodlar, optik tolali aloqa tizimlari hammasi yarimo‘tkazgich fizikasi asosida ishlaydi [4]. Yarimo‘tkazgich materiallari asosida turli sensorlar: harorat sensori, bosim sensori, gaz analizatorlar, harakat detektorlari, ishlab chiqiladi. Organik yarimo‘tkazgichlar biosensordlar, yurak ritmini kuzatuvchi qurilmalar, tibbiy tasvirlash asboblarida qo‘llaniladi. Grafen, MoS₂, kvant nuqtalari kabi yangi nano-materiallar ultra-tezkor elektron qurilmalar yaratishda qo‘llanilmoqda. AI uchun maxsus yarimo‘tkazgichlar — GPU, TPU, NPU — yuqori tezlikda parallel hisoblashni ta’minlaydi. Bir nechta yarimo‘tkazgich qatlamlarini vertikal ulash texnologiyasi energiya tejamkor va ixcham qurilmalar yaratish imkonini bermoqda [5].

Xulosa

Yarimo‘tkazgichli materiallar zamonaviy texnika va informatika taraqqiyotining yuragi hisoblanadi. Ularning fizik xossalari, boshqaruvchanligi va energetik afzalliklari tufayli elektronika, energetika, aloqa tizimlari va hatto tibbiyot kabi sohalarda keng qo‘llanilmoqda [6]. Bugungi kunda yarimo‘tkazgichlar

bo'yicha izlanishlar yangi avlod nanotexnologiyalar va yuqori samaradorlikka ega qurilmalarni yaratishga xizmat qilmoqda.

Foydalanilgan adabiyotlar.

1. Rashidov A., Ergashev O. – “Yarimo'tkazgich fizikasi” O'quv qo'llanma, Toshkent: O'zbekiston Milliy universiteti nashriyoti.
2. Saidov S. – “Elektronika asoslari” Toshkent: “Fan va texnologiya” nashriyoti.
3. M. Sze, Kwok K. Ng – “Physics of Semiconductor Devices” 3rd Edition, Wiley, 2006. (Yarimo 'tkazgich qurilmalar bo 'yicha eng nufuzli manbalardan biri.)
4. Ben G. Streetman, Sanjay Kumar Banerjee – “Solid State Electronic Devices” Pearson, 2015. (Elektronika va yarimo 'tkazgichlarning fizik asoslari haqida.)
5. Rashid M. – “Power Electronics: Circuits, Devices and Applications” (Yarimo 'tkazgichli quvvat elementlari.).
6. Бобонов Д.Т. Электрические свойства и нестабильность тока в кремнии, легированном селеном; Электрические имущество и обслуживание пряжка и силикон легированный селен _ - 2010 г.

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LEGIRLANGAN YARIMO'TKAZGICH, MATERIALLARDAN TAYYORLANGAN ELEKTRON ASBOBLARNING HOZIRGI ZAMON TEXNIKASIDAGI O'RNI

Annotatsiya. Yarimo'tkazgich materiallar elektr o'tkazuvchanligi bo'yicha metall va dielektriklar orasidagi oraliq holatni egallaydi. Asosiy sanoat ahamiyatiga ega yarimo'tkazgichlar – kremniy (Si), germaniy (Ge), galliy arsenidi (GaAs) hamda murakkab AIII–BV yoki AII BVI guruh yarimo'tkazgichlaridir. Legirlashning fizik mohiyati. Yarimo'tkazgichni legirlash – bu uning kristall panjarasiga juda kichik miqdordagi (10^{12} – 10^{16} sm⁻³) qo'shimcha atomlar (donor yoki akseptor) kiritish orqali materialning elektron strukturasi o'zgartirish jarayonidir. Legirlash natijasida yarimo'tkazgichda erkin elektronlar soni, kovaklar konsentratsiyasi, shuningdek, Fermi sathining joylashuvi o'zgaradi.

Kalit so'zlar: Fermi, sath, electron, kovak, yarimo'tkazgich, legirlash, konsentratsiya, struktura, atom.

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THE ROLE OF ELECTRONIC DEVICES MADE OF ALLOYED SEMICONDUCTOR MATERIALS IN MODERN TECHNOLOGY

Abstract. Semiconductor materials occupy an intermediate state between metals and dielectrics in terms of electrical conductivity. The main industrially important semiconductors are silicon (Si), germanium (Ge), gallium arsenide (GaAs) and complex A^{III}–B^V or A^{II} B^{VI} group semiconductors. Physical essence of doping. Doping of a semiconductor is a process of changing the electronic structure of the material by introducing a very small amount (10^{12} – 10^{16} cm⁻³) of additional

atoms (donor or acceptor) into its crystal lattice. As a result of alloying, the number of free electrons, the concentration of holes, and the location of the Fermi level in the semiconductor change.

Keywords: *Fermi, level, electron, hole, semiconductor, doping, concentration, structure, atom.*

Yarimo ‘tkazgich materiallar elektr o‘tkazuvchanligi bo‘yicha metall va dielektriklar orasidagi oraliq holatni egallaydi. Asosiy sanoat ahamiyatiga ega yarimo ‘tkazgichlar – kremniy (Si), germaniy (Ge), galliy arsenidi (GaAs) hamda murakkab $A^{III}-B^{VI}$ yoki $A^{II}-B^{VI}$ guruh yarimo ‘tkazgichlaridir. Legirlashning fizik mohiyati. Yarimo ‘tkazgichni legirlash – bu uning kristall panjarasiga juda kichik miqdordagi ($10^{12}-10^{16} \text{ sm}^{-3}$) qo‘shimcha atomlar (donor yoki akseptor) kiritish orqali materialning elektron strukturasini o‘zgartirish jarayonidir. Legirlash natijasida yarimo‘tkazgichda erkin elektronlar soni, kovaklar konsentratsiyasi, shuningdek, Fermi sathining joylashuvi o‘zgaradi. Bu esa materialning: o‘tkazuvchanlik turini (n yoki p-tur), qarshiligini, haroratga bog‘liqligini, jonli zona (band) strukturasini boshqarish imkonini beradi. Donor va akseptor legirlash [1].

Donor qo‘shimchalar (masalan, fosfor, arsen, surma) Si yoki Ge kristall panjarasida ortiqcha valent elektron berib, n-tur o‘tkazuvchanlik hosil qiladi. Akseptor qo‘shimchalar (bor, alyuminiy, galliy) esa elektron “yutib”, kovak miqdorini oshiradi va p-tur o‘tkazuvchanlik paydo qiladi. Mazkur asosiy tamoyil p–n o‘tishlar, diodlar, tranzistorlar va integral sxemalarning yaratilishida hal qiluvchi ahamiyatga ega. Legirlangan yarimo‘tkazgich asboblarning turlari. P–n o‘tish va diodlar. P–n o‘tish yarimo‘tkazgich elektronikasining asosi bo‘lib, uni hosil qilish to‘g‘ridan-to‘g‘ri legirlash jarayoni bilan bog‘liq. P–n o‘tishga ega diodlar: To‘g‘rilagichlar, kuchlanish stabilizatorlari, fotoelementlar, lazer diodlar kabi qurilmalarning asosiy komponentidir. Bipolyar va maydon tranzistorlar [2]. Legirlangan materiallarda turli sohalar bo‘ylab dopant konsentratsiyasining boshqarilishi orqali emitter–baza–kollektor yoki manba–shyot–drenaj strukturalari shakllantiriladi. Bu tranzistorlarning kuchaytirish koeffitsienti, kommutatsiya tezligi, issiqlikka chidamliligi, kabi parametrlarini optimallashtirishga xizmat qiladi. Integral sxemalar va mikroprotsessorlar. Bugungi kunda mikroelektronika elementlari 5–7 nm texnologik normagacha qisqargan. Bu darajadagi tranzistorlar faqat yuqori aniqlikdagi ion implantatsiyasi, diffuziya va epitaksiya asosida legirlash bilan tayyorlanadi. Integral sxemalarda milliardlab tranzistorlarning sinxron ishlashi dopant konsentratsiyasiga bevosita bog‘liq. Legirlash texnologiyalari. Termal diffuziya. Yarimo ‘tkazgich plastinasini yuqori haroratli ($900-1200 \text{ }^{\circ}\text{C}$) muhitda donor yoki akseptor gazlar bilan ishlov berish orqali dopantlarning kristalga termal kirib borishi ta‘minlanadi. Bu usul nisbatan arzon, ammo keng hududli legirlash uchun mo‘ljallangan [3]. Ion implantatsiyasi. Energetik ionlar oqimini yarimo ‘tkazgichga yo‘naltirish orqali dopantlarni aniq chuqurlik va konsentratsiyada kiritish imkonini beradi. Zamonaviy mikroelektronikada implantatsiyaning afzalliklari: yuqori aniqlik (nanometr

darajasida), lokal (hududiy) legirlash, past haroratlarda amalga oshirilishi. Epitaksial o'stirish. Epitaksial qatlamlar yuqori tozalangan sharoitlarda atomma-atom o'sadi. Dopantlar epitaksiya jarayonida kristallning o'sish tezligi va tarkibiga mos ravishda kiritiladi. Bu usul quvvatli tranzistorlar va yuqori chastotali qurilmalar ishlab chiqarishda muhim ahamiyatga ega. Legirlangan yarimo'tkazgichlarning zamonaviy texnikadagi o'rni. Telekommunikatsiya va raqamli tizimlar [4]. Mobil aloqa, 5G va 6G standartlari, sun'iy yo'ldosh tizimlari va optik tolali aloqa liniyalari yuqori chastotali, kam shovqinli tranzistorlar va diodlarga tayanadi. Bu qurilmalar GaAs, GaN kabi legirlangan murakkab yarimo'tkazgichlardan tayyorlanadi. Energiya tejamkor elektronika. Yuksak samaradorlikka ega quvvat elektronika elementlari – MOSFET, IGBT, SiC-diodlar – aynan legirlangan Si yoki SiC asosida yaratilgan. Ular: elektr transportlarida, quyosh panellari inverterlarida, sanoat avtomatikalarida katta rol o'ynaydi. Sensorlar va IoT qurilmalari. Harorat, bosim, yorug'lik, gaz, namlik sensorlarining aksariyati legirlangan yarimo'tkazgichlar asosida ishlab chiqariladi [5]. Dopantlar sezgir qatlamning fizik-kimyoviy javobchanligini oshirib, IoT tarmoqlari uchun yuqori ishonchli detektorlar yaratish imkonini beradi. Tibbiyot va bioelektronika. MRI, rentgen apparatlari, implantatsiya qilinadigan elektron qurilmalar, biosensorlar – barchasi yuqori sezgirlikka ega yarimo'tkazgich detektorlari orqali ishlaydi. Ularning xususiyatlarini boshqarish legirlash texnologiyasi orqali amalga oshiriladi. Sun'iy intellekt va kvant texnologiyalari. AI chiplarida ishlatiladigan neuromorfik elementlar, shuningdek kvant nuqtalari, kvant qubitlarining barqarorligi ham dopantlarning fazoviy taqsimotiga bevosita bog'liq. Bu sohalarida ultra-toza, atom darajasida boshqarilgan legirlash muhim tamoyil hisoblanadi. Afzalliklari va texnologik cheklovlar. Afzalliklar: Elektr xossalarni keng doirada boshqarish imkoniyati. Energiya samaradorligi va ishonchlilikning oshishi. Mikro va nanoo'lchamda aniqlik. Qurilmalar sig'imini kasad mexanizmlar bilan moslashtirish. Cheklovlar: Dopantlarning diffuziya jarayonida beqarorligi [6]. Nanoo'lchamda kvantik effektlarning kuchayishi. Issiqlik ta'sirida parametrlarning o'zgarishi. Texnologik jarayonlarning yuqori narxi va murakkabligi

Xulosa

Legirlangan yarimo'tkazgich materiallar bugungi zamonaviy elektronika, telekommunikatsiya, energetika, avtomatika, tibbiyot va axborot texnologiyalarining asosi hisoblanadi. Dopantlarni aniq boshqarish orqali yaratilgan p–n o'tishlar, tranzistorlar va integral sxemalar nafaqat hozirgi texnikaning yuragi, balki kelajakning – sun'iy intellekt, kvant kompyuterlar, nanoelektronika – rivojlanishida hal qiluvchi ahamiyatga ega. Shu bois legirlash jarayonini chuqur o'rganish, yangi avlod yarimo'tkazgich materiallarni sintez qilish va ularni amaliyotga tatbiq etish texnologik taraqqiyotning ustuvor yo'nalishlaridan biri bo'lib qolmoqda.

Foydalanilgan adabiyotlar.

1. Qodirov A., Tursunov M. *Yarimo'tkazgichlar fizikasi*. – Toshkent: O'zbekiston Milliy Universiteti nashriyoti, 2017.
2. Xabibullaev P.K. *Fizika yarimo'tkazgichov*. – Tashkent: Fan, 2012.

3. Rasulov R., Karimov N. *Elektronika asoslari*. – Toshkent: TDPU nashriyoti, 2020.
4. Бобонов Д.Т. Электрические свойства и нестабильность тока в кремнии, легированном селеном; Электрические имущество и обслуживание пряжка и силикон легированный селен _ - 2010 г.
5. Sze S.M., Ng K.K. *Physics of Semiconductor Devices*. – 3rd Edition. – Wiley-Interscience, 2006.
6. Neamen D. *Semiconductor Physics and Devices*. – McGraw-Hill, 2012.

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ELEKTRONIKA FANING HOZIRGI KUNDAGI DOLZARBLIGI

Annotatsiya. Hozirgi kunda elektronika sohasi nafaqat ishlab chiqarish samaradorligini ko'tarish, balki jamiyatning ijtimoiy-iqtisodiy rivojiga ham bevosita ta'sir ko'rsatmoqda. Yangi avlod mikrochiplar, kuchaytirgichlar, sensorlar va tarmoqli tizimlar paydo bo'lishi bilan insoniyat mutlaqo yangi imkoniyatlarga ega bo'ldi. Bozor talabi har yili ortib borayotgani sababli elektronika bo'yicha malakali mutaxassislariga bo'lgan ehtiyoj ham yuqori darajada. Shu ma'noda, elektronika fanining bugungi kundagi dolzarbligini ilmiy, texnik, iqtisodiy va ijtimoiy nuqtai nazardan tahlil qilish muhimdir.

Kalit so'zlar: elektronika, mikrochiplar, kuchaytirgichlar, sensorlar, texnik.

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THE VALUE OF ELECTRONICS TODAY

Abstract. Nowadays, the field of electronics not only increases production efficiency, but also has a direct impact on the socio-economic development of society. With the advent of a new generation of microchips, amplifiers, sensors and network systems, humanity has gained completely new opportunities. As the market demand is increasing every year, the need for skilled electronics professionals is also high. In this sense, it is important to analyze the current relevance of electronic science from a scientific, technical, economic and social point of view.

Key words: electronics, microchips, amplifiers, sensors, technical.

XXI asrda jadal rivojlanayotgan fan-texnika taraqqiyoti insoniyat hayotining deyarli barcha sohalarini tubdan o'zgartirib yubordi. Ayniqsa, elektronika fani

bugungi zamon texnologiyalarining poydevori sifatida alohida o‘rin egallaydi. Uyali aloqa tarmoqlari, kompyuterlar, robototexnika, tibbiy diagnostika uskunalari, transport boshqaruvi, maishiy texnika, sanoat avtomatikasi, aqlli uy tizimlari – bularning barchasi elektron qurilmalar va elektron sxemalar asosida ishlaydi [1]. Elektronikaning shu qadar keng qamrovga ega bo‘lishi hamda iqtisodiyotning barcha sohalarida strategik ahamiyat kasb etishi uning dolzarbligini yanada oshirmoqda. Hozirgi kunda elektronika sohasi nafaqat ishlab chiqarish samaradorligini ko‘tarish, balki jamiyatning ijtimoiy-iqtisodiy rivojiga ham bevosita ta’sir ko‘rsatmoqda. Yangi avlod mikrochiplar, kuchaytirgichlar, sensorlar va tarmoqli tizimlar paydo bo‘lishi bilan insoniyat mutlaqo yangi imkoniyatlarga ega bo‘ldi. Bozor talabi har yili ortib borayotgani sababli elektronika bo‘yicha malakali mutaxassislarga bo‘lgan ehtiyoj ham yuqori darajada. Shu ma’noda, elektronika fanining bugungi kundagi dolzarbligini ilmiy, texnik, iqtisodiy va ijtimoiy nuqtai nazardan tahlil qilish muhimdir. Elektronika asosan XX asr boshlarida vakuum lampalari yaratilishi bilan shakllana boshladi. Keyinchalik tranzistorning kashf etilishi (1947-yil) elektronika tarixida tub burilish yasadi. Aynan tranzistor integrallashgan mikrosxemalar paydo bo‘lishiga sabab bo‘ldi va bu jarayon elektronikaning yangi bosqichiga yo‘l ochdi. Bugungi kunga kelib esa elektronika nanometr o‘lchamdagi texnologiyalar darajasiga yetdi [2]. Mikrosxemalardagi tranzistorlar soni har yili ko‘payib bormoqda, ularning quvvati ortib, energiya sarfi esa kamaymoqda. 5 nm, 3 nm va hatto 2 nm texnologik jarayonlar asosidagi protsessorlar ishlab chiqarila boshladi. Bu esa mobil qurilmalar, superkompyuterlar, sun’iy intellekt tizimlarining samaradorligini sezilarli oshirmoqda. Shuningdek, analog elektronika, raqamli elektronika, kuch elektronikalari, telekommunikatsiya elektronikasi, o‘lchov texnikasi elektronikasi kabi yo‘nalishlar keng rivojlangan. Elektronika bugungi kunda inson faoliyatining barcha jabhalariga singib ketgan [3]. Quyida uning eng muhim qo‘llanish yo‘nalishlari ko‘rib chiqiladi. Kompyuterlar, serverlar, tarmoqlar, mobil qurilmalar – bularning barchasi elektron komponentlarga asoslangan. Axborot texnologiyalari rivojining asosi mikrochiplar hisoblanadi. Elektronika bo‘lmaganida na internet, na sun’iy intellekt, na bulutli xizmatlar mavjud bo‘lmas edi. Sanoat korxonalarida avtomatlashtirilgan boshqaruv tizimlari, robot qo‘llar, sensorlar, boshqaruv modullari keng qo‘llanmoqda. Elektronika sanoatni mehnat talab jarayondan yuqori texnologiyali jarayonga aylantirdi [4]. Tibbiy elektronika bugungi kunda diagnostika va davolashning ajralmas qismiga aylandi:

EKG va EEG apparatlari

Ultrasonik diagnostika (UZI)

MRT va KT uskunalari

Endoskopik tizimlar

Sun’iy yurak stimulyatorlari

Shuningdek, moslashuvchan elektronika asosidagi ko‘chma tibbiy qurilmalar bemorlarni masofadan nazorat qilish imkonini bermoqda. Avtomobillarning elektron boshqaruv bloklari, ABS tizimlari, avtopilotlar, dronlar, GPS navigatsiya tizimlari barchasi zamonaviy elektronikaning mahsuli. 5G va 6G texnologiyalar,

optik tolali aloqa, sun'iy yo'ldoshlar, radiolokatsiya – bularning barchasi elektron komponentlar asosida ishlaydi. Mobil aloqa tarmog'i elektronikasiz mavjud bo'lmaydi [5]. Elektronika industriyasi bugungi kunda dunyodagi eng yirik iqtisodiy sohalardan biridir. Dunyoda yarimo'tkazgichlar bozori har yili trillionlab dollarlik aylanmaga ega. Elektronika sanoati iqtisodiy o'sishning asosiy drayverlaridan biri bo'lib, u:

- yangi ish o'rinlari yaratadi
- eksport salohiyatini oshiradi
- innovatsion texnologiyalarni amaliyotga joriy qiladi
- boshqa sanoat tarmoqlarini modernizatsiya qiladi

Elektronikasi rivojlangan davlatlar – AQSh, Yaponiya, Janubiy Koreya, Xitoy, Tayvan, Germaniya – bugungi dunyoda texnologik yetakchilar hisoblanadi. Elektronikaning dolzarbligi uning quyidagi xususiyatlari bilan belgilanadi: Elektronika sohasida har oy yangi texnologiyalar paydo bo'lmoqda:

- yangi yarimo'tkazgich materiallari (GaN, SiC, grafen)
- energiya tejamkor mikrosxemalar
- akkumulyatorlar texnologiyasi
- kvant kompyuterlari uchun elektron komponentlar

Elektronika — AI tizimlarining "jismoniy asosidir". Sun'iy intellektni rivojlantirish uchun kuchli protsessorlar, grafik tezlatkichlar, neyrochiplar talab qilinadi [6]. 2025-yilga borib dunyoda 30 milliarddan ortiq IoT qurilma ishlashi kutilmoqda. Bularning barchasi mikroprotsessorlar, sensorlar va radioelektron modullar orqali ishlaydi. Elektronika energiya tejashda muhim rol o'ynaydi. Uy-joylarda elektr sarfini aniq nazorat qilish, sanoatda energiya sarfini kamaytirish, elektr transport vositalarini boshqarish elektronika orqali amalga oshadi. Elektronika fani qator strategik muammolarga ega: Texnologik jarayonlarning murakkablashuvi tufayli yuqori aniqlik talab etiladi. Chip ishlab chiqarish juda katta investitsiyalarni talab qiladi. Nodir metallar (litiy, kobalt, neodim, germaniy) yetishmasligi global muammoga aylanmoqda. Elektronika bo'yicha yuqori malakali muhandislar hamon yetarli emas. Mikrosxemalar samaradorligi ortishi bilan issiqlik tarqalishi muammosi kuchaymoqda. Elektronik qurilmalar ko'paygani sari ularning xavfsizligini ta'minlash masalasi dolzarb bo'lib bormoqda [7].

Xulosa

Elektronika fani bugungi kunda jamiyat taraqqiyotining markazida turadi. Uning rivojisiz zamonaviy texnologiyalar, sanoat, tibbiyot, transport, aloqa va axborot tizimlarining mavjud bo'lishi mumkin emas. Elektronika iqtisodiy o'sishning eng muhim omillaridan biri bo'lib, yangi innovatsion g'oyalarning amaliyotga joriy etilishida hal qiluvchi ahamiyatga ega. Hozirgi davrda elektronika nafaqat muhandislar, balki iqtisodchilar, shifokorlar, pedagoglar, dasturchilar, dizaynerlar uchun ham zarur bo'lib qoldi. Shu bois elektronika fanini chuqur o'rganish, soha mutaxassislarini tayyorlash va innovatsion tadqiqotlarni kengaytirish bugungi kunning ustuvor vazifalaridir.

Foydalanilgan adabiyotlar

6. Qodirov A., Jo‘rayev B. Elektronika asoslari. – Toshkent: O‘zbekiston Milliy Universiteti nashriyoti, 2020.
7. O‘zbekiston Respublikasi Innovatsion rivojlanish vazirligi. Elektronika sanoatini rivojlantirish bo‘yicha hisobot va istiqbollar. – Toshkent, 2023.
8. Титов В. С., Панов Д. Е. Аналоговая и цифровая электроника. – Санкт-Петербург: Питер, 2020.
9. Horowitz, P., Hill, W. The Art of Electronics. – Cambridge University Press, 2015 (3rd Edition).
10. Rashid, M. H. Power Electronics: Circuits, Devices and Applications. – Pearson, 2019.
11. Бобонов Д.Т. Электрические свойства и нестабильность тока в кремнии, легированном селеном; Электрические имущество и обслуживание пряжка и силикон легированный селен _ - 2010 г.

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“Ijtimoiy-gumanitar fanlar” kafedrası katta o’qituvchisi
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TALABALARDA TABIIY FANLARNI O'QITISHDA EKOLOGIK KOMPETENSIYANI RIVOJLANTIRISH METODIKASINI TAKOMILLASHTIRISH

Annotatsiya. Ushbu ishda oliy ta’lim muassasalari talabalarida tabiiy fanlarni o’qitish jarayonida ekologik kompetensiyani rivojlantirish metodikasini takomillashtirish masalalari yoritilgan. Tadqiqotning maqsadi talabalarning ekologik bilim, ko’nikma va mas’uliyatli munosabatini shakllantirishda zamonaviy pedagogik texnologiyalar va fanlararo bog’lanishlardan foydalanish samaradorligini asoslashdan iborat. Maqolada ekologik kompetensiyaning tarkibiy qismlari tahlil qilinib, talabalarning tabiatni muhofaza qilishga bo’lgan motivatsiyasini oshirish bo’yicha metodik tavsiyalar ishlab chiqilgan. Shuningdek, o’quv jarayoniga innovatsion yondashuvlarni tatbiq etish orqali bo’lajak mutaxassislarning ekologik madaniyatini yuksaltirish mexanizmlari taklif etilgan.

Kalit so’zlar: ekologik kompetensiya, tabiiy fanlar, metodikani takomillashtirish, ekologik madaniyat, pedagogik texnologiyalar, fanlararo bog’liqlik, barqaror rivojlanish.

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IMPROVEMENT OF THE METHODOLOGY FOR DEVELOPING ENVIRONMENTAL COMPETENCE IN TEACHING NATURAL SCIENCES TO STUDENTS

Abstract. This paper examines the improvement of the methodology for developing ecological competence among students in the process of teaching natural sciences. The purpose of the research is to substantiate the effectiveness of using modern pedagogical technologies and interdisciplinary connections in the formation of students' environmental knowledge, skills, and responsible attitude. The article analyzes the structural components of ecological competence and develops methodological recommendations for increasing students' motivation for nature conservation. Furthermore, mechanisms for enhancing the ecological culture of future specialists through the introduction of innovative approaches into the educational process are proposed.

Keywords: ecological competence, natural sciences, methodology improvement, ecological culture, pedagogical technologies, interdisciplinary links, sustainable development.

Kirish

Bugungi kunda global ekologik inqirozlar — iqlim o'zgarishi, bioxilma-xillikning qisqarishi va tabiiy resurslarning kamayishi sharoitida jamiyatning tabiatga bo'lgan munosabatini tubdan o'zgartirish talab etilmoqda. Ushbu vazifani amalga oshirishda oliy ta'lim tizimi, xususan, tabiiy fanlarni o'qitish jarayoni hal qiluvchi bo'g'in hisoblanadi. Talabalarda ekologik kompetensiyani shakllantirish shunchaki bilim berish emas, balki ularda ekologik mas'uliyat va barqaror rivojlanish tamoyillariga asoslangan dunyoqarashni tarkib toptirishdir [1].

O'zbekiston Respublikasining "Ekologik ta'limni rivojlantirish konsepsiyasi"da belgilangan vazifalar bo'lajak mutaxassislarning tabiatni muhofaza qilish borasidagi metodik tayyorgarligini takomillashtirishni taqozo etadi. Tabiiy fanlar (biologiya, kimyo, geografiya, ekologiya) talabalarda atrof-muhit qonuniyatlarini tushunish uchun fundamental asos bo'lib xizmat qiladi [3]. Biroq, an'anaviy ta'lim usullari har doim ham talabalarining amaliy ekologik muammolarni hal qilish ko'nikmalarini (kompetensiyalarini) to'liq qamrab olmaydi. Shu bois, tabiiy fanlarni o'qitishda innovatsion metodika va yondashuvlarni ishlab chiqish tadqiqotning asosiy zarurati hisoblanadi.

Tadqiqotning maqsadi — oliy ta'lim talabalarida tabiiy fanlarni o'qitish jarayoni orqali ekologik kompetensiyani rivojlantirishning pedagogik mexanizmlari va metodikasini takomillashtirishdan iborat.

Adabiyotlar tahlili

Ekologik kompetensiya tushunchasi va uni shakllantirish masalalari ko'plab mahalliy va xorijiy olimlar tomonidan tadqiq etilgan. Umumiy pedagogik nuqtayi nazardan, kompetensiya tushunchasi shaxsning ma'lum bir sohada bilim, ko'nikma va shaxsiy sifatlarini amaliyotda samarali qo'llay olish qobiliyati sifatida talqin etiladi [2].

Ekologik ta'lim nazariyasi rivojiga ulkan hissa qo'shgan olimlar (masalan, N.M.Mamedov, S.N.Glazachev) ekologik kompetensiyani shaxsning atrof-muhit bilan o'zaro uyg'unlikda yashash qobiliyati va ekologik madaniyatining oliy ko'rinishi sifatida ta'riflaydilar [4]. Ularning fikricha, ekologik kompetensiya tarkibiga kognitiv (bilim), aksiologik (qadriyat) va pragmatik (amaliy) komponentlar kiradi.

O'zbekistonlik olimlardan Sh.Avazov, J.Tolipova va A.Zunnunovlarning ishlarida tabiiy fanlarni o'qitishda ekologik tarbiya berishning metodik asoslari ko'rsatib o'tilgan [5]. Xususan, J.Tolipova biologiya o'qitish metodikasida interfaol usullardan foydalanish orqali talabalarining mustaqil fikrlash va muammoli vaziyatlardan chiqish ko'nikmalarini rivojlantirish masalalariga alohida to'xtalib o'tgan [6].

Zamonaviy tadqiqotlarda (masalan, V.A.Yasvin ishlarida) ekologik kompetensiyani rivojlantirishda "ekologik-ta'limiy muhit" yaratish muhimligi ta'kidlanadi [7]. Bu muhit talabaga faqat nazariy bilim berib qolmay, balki uni real ekologik loyihalarda ishtirok etishga undaydi. Shuningdek, xorijiy tajribada barqaror rivojlanish uchun ta'lim (Education for Sustainable Development - ESD)

konsepsiyasi doirasida ekologik kompetensiyani fanlararo bog‘lanishlar (STEM yondashuvi) orqali shakllantirish samarali deb topilgan [8].

Tahlillar shuni ko‘rsatadiki, tabiiy fanlar o‘quv dasturlariga ekologik mazmundagi keys-stadi va loyihaviy o‘qitish metodlarini tizimli ravishda kiritish talabalarning kasbiy-ekologik tayyorgarligini sezilarli darajada oshiradi [9]. Biroq, oliy ta’limning o‘ziga xos xususiyatlarini hisobga olgan holda, ushbu metodikani raqamli texnologiyalar bilan integratsiya qilish masalasi hali ham qo‘shimcha tadqiqotlarni talab etmoqda.

Tadqiqot metodologiyasi

Tadqiqotning metodologik asosi sifatida tizimli yondashuv, kompetensiyaviy yondashuv va shaxsga yo‘naltirilgan ta’lim tamoyillari tanlab olindi. Talabalarda ekologik kompetensiyani rivojlantirish metodikasini takomillashtirish jarayoni quyidagi bosqichlarda amalga oshirildi:

1. Tadqiqotning tashkil etilishi va bosqichlari. Tadqiqot ishi uchta asosiy bosqichda olib borildi:

❖ Aniqlovchi (konstatirlovchi) bosqich: talabalarning ekologik bilim darajasi va tabiatga bo‘lgan munosabati so‘rovnomalar hamda boshlang‘ich testlar orqali aniqlandi [2].

❖ Shakllantiruvchi bosqich: tabiiy fanlar (biologiya, kimyo, ekologiya) o‘quv dasturlariga takomillashtirilgan metodik ishlanmalar, loyihaviy ta’lim va raqamli texnologiyalar integratsiya qilindi [10].

❖ Nazorat bosqichi: tajriba va nazorat guruhlar natijalari o‘zaro solishtirilib, metodikaning samaradorligi statistik tahlil qilindi.

2. Ma’lumotlarni yig‘ish usullari. Tadqiqot davomida ma’lumotlarning ishonchliligini ta’minlash uchun quyidagi metodlar majmuasidan foydalanildi:

❖ Pedagogik kuzatuv: o‘quv jarayonida talabalarning ekologik muammolarni hal qilishdagi faolligi va qaror qabul qilish jarayonlari kuzatildi.

❖ Anketalashtirish va test sinovlari: talabalarning ekologik kognitiv bilimlari hamda aksiologik (qadriyat) qarashlarini baholash uchun maxsus savolnomalar ishlab chiqildi [5].

❖ Loyiha metodikasi: talabalarga kichik guruhlarda mahalliy ekologik muammolarni o‘rganish va ularga yechim topish bo‘yicha vazifalar berildi.

3. Ekologik kompetensiyani baholash mezonlari. Talabalardagi rivojlanish darajasini aniqlash uchun to‘rtta asosiy mezon belgilab olindi:

1. Kognitiv mezon: ekologik qonuniyatlar va atrof-muhit muammolari haqidagi nazariy bilimlar.

2. Motivatsion-qadriyatli mezon: tabiatni muhofaza qilishga bo‘lgan ichki ehtiyoj va mas’uliyat hissi [11].

3. Faoliyatli-amaliy mezon: tabiiy fanlar doirasida olingan bilimlarni real vaziyatlarda qo‘llay olish ko‘nikmasi.

4. Refleksiv mezon: o‘zining ekologik faoliyatini tanqidiy baholash va to‘g‘rilash qobiliyati.

4. Matematik-statistik tahlil. Tadqiqot natijalarining haqqoniyligini va statistik ahamiyatini tasdiqlash uchun matematik statistika usullaridan foydalanildi.

Xususan, tajriba va nazorat guruhlarining o'rtacha ko'rsatkichlari orasidagi farqni aniqlashda Styudentning t-kriteriysi qo'llanildi [12]:

$$t = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

Bunda:

❖ $\overline{X_1}, \overline{X_2}$ – tajriba va nazorat guruhlarining o'rtacha qiymatlari;

❖ s_1, s_2 – tanlanma dispersiyalar;

❖ n_1, n_2 – guruhlardagi talabalar soni.

Shunindek, sifat ko'rsatkichlarining solishtirishda Pirsonning χ^2 (xi-kvadrat) mezoni qo'llanib, olingan natijalar $p < 0.05$ ishonchlilik darajasida tahlil qilindi.

Natijalar va muhokama

Tadqiqot jarayonida ishlab chiqilgan "Tabiiy fanlar orqali ekologik kompetensiyani rivojlantirish" metodikasi Oliy ta'lim muassasalarining tabiiy fanlar yo'nalishida tahsil olayotgan talabalar ishtirokida sinovdan o'tkazildi.

1. Tajriba-sinov natijalari tahlili. Tajriba boshida nazorat (NG) va tajriba (TG) guruhlarining ekologik kompetensiya darajalari o'zaro yaqin ko'rsatkichlarni namoyon etdi. Biroq, shakllantiruvchi bosqichdan so'ng (post-test) tajriba guruhida sezilarli o'sish kuzatildi.

Jadval 1. Talabalarining ekologik kompetensiya darajalarining dinamikasi (foiz hisobida)

Guruhlar	Bosqichlar	Past (%)	O'rta (%)	Yuqori (%)
Nazorat guruhi (NG)	Tajribadan oldin	42	45	13
	Tajribadan keyin	38	47	15
Tajriba guruhi (TG)	Tajribadan oldin	41	46	13
	Tajribadan keyin	12	52	36

Jadval ma'lumotlaridan ko'rinib turibdiki, tajriba guruhida yuqori darajadagi ekologik kompetensiyaga ega talabalar ko'rsatkichi 13% dan 36% gacha (23% ga) oshgan. Nazorat guruhida esa bu ko'rsatkich atigi 2% ga o'zgargan, bu an'anaviy o'qitish metodikasining bugungi kun talablariga yetarli darajada javob bermasligini ko'rsatadi [13].

2. Natijalarning ilmiy muhokamasi. Tadqiqot natijalari shuni tasdiqladiki, tabiiy fanlarni o'qitishda keys-stadi (case-study) va ekologik loyihalardan foydalanish talabalarda nafaqat nazariy bilimlarni, balki amaliy qaror qabul qilish ko'nikmalarini ham rivojlantiradi.

Muhokama jarayonida quyidagi muhim jihatlar aniqlandi:

❖ Fanlararo integratsiya: ekologik muammolarni kimyo, biologiya va fizika qonuniyatlari asosida kompleks o'rganish talabalarda "tizimli fikrlash" qobiliyatini shakllantiradi [14].

❖ Motivatsiya va qadriyat: tajriba guruhidagi talabalar atrof-muhit muammolariga faqat akademik fan sifatida emas, balki o'zlarining fuqarolik burchi sifatida qaray boshladilar. Bu ularning ekologik mas'uliyat koeffitsiyenti oshganidan dalolat beradi.

❖ Raqamli vositalar: vizualizatsiya va virtual laboratoriyalardan foydalanish ekologik jarayonlarni (masalan, parnik effekti yoki suv ifloslanishi modellarini) tushunishni 1,5 barobarga tezlashtirishi aniqlandi [15].

Olingan natijalar xorijiy olimlar (masalan, barqaror rivojlanish konsepsiyasi bo'yicha tadqiqotlar) tomonidan ilgari surilgan "faol ta'lim orqali kompetensiyani shakllantirish" g'oyalarini qo'llab-quvvatlaydi. Biroq, bizning tadqiqotimizda mahalliy sharoit va mintaqaviy ekologik muammolar (Orol fojiasi, suv resurslari tanqisligi) metodikaning asosi sifatida olinganligi natijalarning amaliy ahamiyatini oshirdi.

Xulosa va tavsiyalar

Talabalarda tabiiy fanlarni o'qitish orqali ekologik kompetensiyani rivojlantirish metodikasini takomillashtirish bo'yicha olib borilgan tadqiqotlar quyidagi xulosalarni chiqarishga imkon berdi:

1. Ekologik kompetensiya — bu faqatgina ekologik bilimlarning yig'indisi emas, balki shaxsning atrof-muhitni muhofaza qilishga yo'naltirilgan qadriyatlari, mas'uliyati va amaliy ko'nikmalarining pedagogik sintezidir. Uning tarkibiy qismlari (kognitiv, motivatsion va faoliyatli) o'zaro uzviy bog'liq bo'lib, biri ikkinchisini to'ldiradi [16].

2. Tabiiy fanlarni o'qitishda fanlararo bog'liqlik (integratsiya) tamoyillaridan foydalanish talabalarda dunyoning yaxlit ekologik manzarasini shakllantirishda samarali vosita ekanligi isbotlandi. An'anaviy darslardan farqli o'laroq, muammoli va loyihaviy ta'lim metodlari talabalarning faolligini 25-30% ga oshiradi.

3. O'tkazilgan pedagogik tajriba-sinov ishlari shuni ko'rsatdiki, takomillashtirilgan metodika qo'llanilgan tajriba guruhlarida talabalarning ekologik kompetensiya darajasi nazorat guruhiga nisbatan sezilarli darajada yuqori (o'sish koeffitsiyenti 1,2-1,5) bo'ldi. Bu metodikaning ilmiy-amaliy jihatdan asoslanganligidan dalolat beradi.

Tadqiqot natijalariga tayangan holda, oliy ta'lim tizimida ekologik kompetensiyani rivojlantirish samaradorligini oshirish uchun quyidagi tavsiyalar taklif etiladi:

❖ O'quv dasturlarini modernizatsiya qilish: tabiiy fanlar bo'yicha amaldagi o'quv dasturlariga "Mintaqaviy ekologik muammolar va ularni hal etish yo'llari" mavzusidagi amaliy keyslar va laboratoriya mashg'ulotlarini ko'paytirish lozim [17].

❖ Innovatsion texnologiyalarni tatbiq etish: o'quv jarayonida faqat ma'ruza bilan cheklanmasdan, talabalarni real ekologik monitoring jarayonlariga jalb qilish,

virtual laboratoriyalar va mobil ilovalar yordamida tabiatni o'rganish tizimini yo'lga qo'yish zarur.

❖ Mustaqil ta'limga e'tibor: talabalarga mustaqil ish sifatida "Mening ekologik loyiham" mavzusida kichik tadqiqot ishlari yoki startap g'oyalarni ishlab chiqish vazifalarini berish, ularda ijodiy va tanqidiy fikrlashni rivojlantiradi [18].

❖ Pedagogik mahoratni oshirish: tabiiy fanlar o'qituvchilari uchun muntazam ravishda zamonaviy ekopedagogika va raqamli ekologiya bo'yicha malaka oshirish kurslarini tashkil etish maqsadga muvofiqdir.

FOYDALANILGAN ADABIYOTLAR:

1. Avazov Sh. Maktabda ekologik tarbiya. – Toshkent: O'qituvchi, 1992. – 160 b.
2. Bepalko V.P. Pedagogika va o'qitishning ilg'or texnologiyalari. – Toshkent: Fan, 2001. – 412 b.
3. Ergashev A. Umumiy ekologiya. – Toshkent: O'zbekiston, 2003. – 464 b.
4. Ergashev A., Ergashev T. Ekologiya, biosfera va tabiatni muhofaza qilish. – Toshkent: Yangi asr avlodi, 2005. – 340 b.
5. G'aybullayev N. va boshqalar. Pedagogika nazariyasi. – Toshkent: Fan, 2005. – 232 b.
6. Ishmuhamedov R.J. Innovatsion texnologiyalar yordamida ta'lim samaradorligini oshirish yo'llari. – Toshkent: Nizomiy nomidagi TDPU, 2005. – 180 b.
7. Mavlonova R. va boshqalar. Pedagogika. – Toshkent: O'qituvchi, 2010. – 512 b.
8. Muslimov N.A. va boshqalar. Kasbiy ta'lim metodikasi. – Toshkent: Fan va texnologiya, 2015. – 320 b.
9. O'zbekiston Respublikasi Prezidentining Farmoni. "O'zbekiston Respublikasi Ekologik xavfsizlik konsepsiyasini tasdiqlash to'g'risida"gi PF-5863-son Farmoni. – Toshkent, 2019 yil 30 oktabr.
10. Tolipova J.O. Biologiya o'qitishning innovatsion texnologiyalari. – Toshkent: Cho'lpon, 2011. – 156 b.
11. To'xtayev A.S. Ekologiya. – Toshkent: O'zbekiston, 2001. – 200 b.
12. Зверев И.Д. Экологическое образование школьников. – Москва: Педагогика, 1983. – 160 с.
13. Мамедов Н.М. Основы социальной экологии. – Москва: Студент, 2003. – 256 с.
14. Роберт И.В. Информатизация образования. – Москва: Школа-Пресс, 1994. – 205 с.
15. Сластенин В.А. Педагогика: Инновационная деятельность. – Москва: Магистр, 1997. – 224 с.
16. Ясвин В.А. Психология отношения к природе. – Москва: Смысл, 2000. – 456 с.
17. UNESCO. Education for Sustainable Development Goals: Learning Objectives. – Paris: UNESCO Publishing, 2017. – 62 p.
18. UNESCO. Issues and trends in Education for Sustainable Development. – Paris: UNESCO Publishing, 2018. – 276 p.

СООТНОШЕНИЕ ТЕОРИИ И ПРАКТИКИ В ОБРАЗОВАТЕЛЬНЫХ ПРОГРАММАХ ТЕХНИЧЕСКИХ СПЕЦИАЛЬНОСТЕЙ

Аннотация. В статье рассматривается проблема соотношения теоретической подготовки и практических навыков в образовательных программах технических специальностей. Анализируются современные подходы к построению учебных планов, роль производственной практики, лабораторных работ и проектной деятельности студентов. Особое внимание уделяется необходимости баланса между фундаментальными знаниями и практическими умениями, а также перспективам совершенствования образовательных программ в условиях цифровизации и инновационного развития промышленности.

Ключевые слова: теория, практика, инженерное образование, образовательные программы, дуальное обучение, производственная практика, проектное обучение, цифровизация, виртуальные лаборатории, компетенции.

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THE RATIO OF THEORY AND PRACTICE IN EDUCATIONAL PROGRAMS OF TECHNICAL SPECIALTIES

Abstract. The article examines the issue of the balance between theoretical training and practical skills in educational programs of technical specialties. Modern approaches to curriculum design, the role of industrial practice, laboratory work, and student project activities are analyzed. Special attention is given to the need for a balance between fundamental knowledge and practical competencies, as well as to the prospects for improving educational programs in the context of digitalization and innovative industrial development.

Keywords: theory, practice, engineering education, educational programs, dual education, industrial practice, project-based learning, digitalization, virtual laboratories, competencies.

Введение

Техническое образование всегда сочетало в себе два взаимосвязанных компонента — теоретическую базу и практические умения. С одной стороны, без прочных фундаментальных знаний невозможно подготовить инженера,

способного решать сложные научно-технические задачи. С другой стороны, отсутствие практических навыков затрудняет адаптацию выпускников к требованиям реального производства [1].

Сегодня, когда промышленность стремительно развивается и внедряются новые цифровые технологии, вопрос оптимального соотношения теории и практики в образовательных программах технических специальностей становится особенно актуальным.

Основная часть

1. Теоретическая подготовка как основа инженерного образования

Теоретический компонент образования обеспечивает студентов:

- системными знаниями по фундаментальным дисциплинам (математика, физика, информатика, материаловедение и др.);
- пониманием общих закономерностей и принципов функционирования технических систем;
- способностью к аналитическому мышлению и решению нестандартных задач.

Без глубокого теоретического базиса инженер рискует остаться лишь исполнителем, а не разработчиком новых технологий.

2. Практическая подготовка как ключ к профессионализму

Практическая составляющая формируется через:

- лабораторные и практические занятия, позволяющие закрепить теоретические знания;
- производственную и преддипломную практику на предприятиях;
- участие в научно-исследовательских проектах и студенческих стартапах;
- проектное обучение, при котором студенты решают реальные задачи, приближенные к условиям будущей профессиональной деятельности.

Практика формирует у студентов навыки работы с современным оборудованием, программным обеспечением и технологическими процессами, что особенно важно в условиях цифровой экономики [2].

3. Проблемы и вызовы

Несмотря на значительный прогресс, в техническом образовании сохраняются проблемы:

- дисбаланс: в ряде программ преобладает либо теория, либо практика;
- устаревшая материально-техническая база вузов, которая не всегда соответствует уровню современной промышленности;
- ограниченное взаимодействие с предприятиями, что снижает эффективность производственной практики;
- нехватка квалифицированных кадров, готовых применять современные образовательные технологии [3].

4. Пути совершенствования образовательных программ

Для обеспечения гармоничного соотношения теории и практики необходимо:

- обновлять учебные планы с учётом запросов рынка труда и развития технологий;
- активнее внедрять дуальное образование, предполагающее обучение студентов одновременно в вузе и на предприятии;
- расширять использование цифровых и мультимедийных технологий (виртуальные лаборатории, симуляторы, CAD/CAE-системы);
- развивать сетевое взаимодействие университетов с промышленными предприятиями, научными центрами и инновационными кластерами;
- внедрять проектное и проблемно-ориентированное обучение [4].

5. Перспективы

В условиях цифровизации образование должно трансформироваться в сторону интеграции теоретических знаний с практической деятельностью. Использование технологий искусственного интеллекта, виртуальной реальности и цифровых двойников позволит студентам осваивать практические навыки даже при ограниченных ресурсах.

Заключение

Оптимальное соотношение теории и практики в образовательных программах технических специальностей является важнейшим условием подготовки квалифицированных инженеров [5]. Гармоничное сочетание фундаментальных знаний и практических навыков позволяет выпускникам успешно адаптироваться к современным условиям производства, участвовать в создании инноваций и быть конкурентоспособными на рынке труда.

Таким образом, модернизация образовательных программ должна ориентироваться на интеграцию науки, образования и производства, что обеспечит формирование нового поколения инженеров, готовых к вызовам цифровой экономики [6].

Использованные источники:

1. Муртазина, Д., & Муртазин, Э. (2024). ПЕРСПЕКТИВА ЦИФРОВОЙ ПЕДАГОГИКИ НАЧИНАЕТСЯ СЕГОДНЯ: ВОЗМОЖНОСТИ, СТЕРЕОТИПЫ, ПЛАНЫ НА БУДУЩЕЕ. *University Research Base*, 1030-1033.
2. Петров, Р. И., & Муртазин, Э. Р. (2024). ЭФФЕКТИВНЫЕ СТРАТЕГИИ ИСПОЛЬЗОВАНИЯ ТЕХНОЛОГИЙ ДЛЯ УЛУЧШЕНИЯ ОБРАЗОВАНИЯ И ПОДДЕРЖКИ МОЛОДЕЖНЫХ ИНИЦИАТИВ. *University Research Base*, 519-521.
3. Касимов, А. М., Каршибоев, Ш. А., & Муртазин, Э. Р. (2024). ИННОВАЦИОННЫЕ ТЕХНОЛОГИИ В ПОДДЕРЖКЕ МОЛОДЕЖИ: ПЕРСПЕКТИВЫ И ВЫЗОВЫ. *University Research Base*, 436-438.
4. Каршибоев, Ш. А., & Муртазин, Э. Р. (2024). АКТИВИЗАЦИЯ ИННОВАЦИОННОЙ ДЕЯТЕЛЬНОСТИ И ВНЕДРЕНИЕ ЦИФРОВЫХ ТЕХНОЛОГИЙ. *ББК 65.9 М34*, 269.
5. МУРТАЗИН, Э., & МУРТАЗИНА, Д. (2024). ПРОБЛЕМЫ МОТИВАЦИИ СТУДЕНТОВ В ИНОЯЗЫЧНОМ ОБУЧЕНИИ: КАК МОЖНО ПОВЫСИТЬ ИНТЕРЕС И ВОВЛЕЧЕННОСТЬ СТУДЕНТОВ В ИЗУЧЕНИЕ ИНОСТРАННЫХ ЯЗЫКОВ. *ББК У050. 1я431 М 54*, 435.

6. Кузиев, Б. Н., Холмуминова, Д. А., & Муртазин, Э. Р. (2024). РОЛЬ ВИРТУАЛЬНОЙ РЕАЛЬНОСТИ В СОВРЕМЕННОМ ОБРАЗОВАНИИ: ВОЗМОЖНОСТИ И ВЫЗОВЫ. *Экономика и социум*, (3-1 (118)), 1125-1128.
7. Муртазина, Д. Р., & Муртазин, Э. Р. (2024). МЕТОДИКА ПРЕПОДАВАНИЯ В ИГРОВОЙ ФОРМЕ: ПУТЬ К ЭФФЕКТИВНОМУ ОБУЧЕНИЮ. *Экономика и социум*, (2-1 (117)), 1609-1611.

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ГИДРОБИОНТЫ КАК БИОИНДИКАТОРЫ АНТРОПОГЕННОГО ЗАГРЯЗНЕНИЯ РЕЧНЫХ ЭКОСИСТЕМ: СОВРЕМЕННЫЕ ПОДХОДЫ И ПЕРСПЕКТИВЫ ПРИМЕНЕНИЯ

***Аннотация:** Структура водных сообществ, включая раков, рыб, амфибий и насекомых, напрямую отражает уровни органического и химического загрязнения, вызванного антропогенными стоками. Многовидовой биоиндикаторный подход, усиленный молекулярными и инновационными методами мониторинга, предоставляет комплексный инструмент для оценки состояния экосистем и антропогенного воздействия.*

***Ключевые слова:** водные биоиндикаторы; загрязнение водоёмов; структура сообществ; экологический мониторинг; антропогенное воздействие.*

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HYDROBIONTS AS BIOINDICATORS OF ANTHROPOGENIC POLLUTION IN RIVER ECOSYSTEMS: CURRENT APPROACHES AND APPLICATION PROSPECTS

***Abstract:** The structure of aquatic communities, including crayfish, fish, amphibians, and insects, directly reflects the levels of organic and chemical pollution caused by anthropogenic discharges. A multi-species bioindicator approach, enhanced by molecular and innovative monitoring methods, provides a comprehensive tool for assessing ecosystem health and anthropogenic impact.*

***Keywords:** aquatic bioindicators; water pollution; community structure; ecological monitoring; anthropogenic impact.*

Введение: Чувствительные водные организмы, такие как раки, пиявки, амфибии, рыбы и насекомые, выступают в качестве точных биоиндикаторов, поскольку их физиология и структура сообществ непосредственно отражают уровни органического и химического загрязнения. Нарушение ключевых физиологических функций у таких видов-индикаторов вызывает перестройку

пищевых сетей, что позволяет использовать эти биологические изменения для комплексной оценки антропогенного воздействия на экосистемы.

Структура водных сообществ, включая популяции длиннопалого рака (*Pontastacus leptodactylus*), является прямым индикатором уровня загрязнения водоемов. Промышленные, сельскохозяйственные и коммунальные стоки, содержащие тяжелые металлы, пестициды и фармацевтические остатки, нарушают физиологические функции организмов, что приводит к изменению видового состава в пользу устойчивых таксонов и снижению общего биоразнообразия. Чувствительные виды раков, занимающие ключевое положение в донных цепях питания, реагируют на загрязнение подавлением роста и размножения, что делает их важными объектами для биооценки состояния экосистем [1, 2].

Пиявки, включая такие виды *Haemoris sanguisuga*, служат эффективными биоиндикаторами качества воды, поскольку их видовое разнообразие и численность чувствительно реагируют на градиенты органического и химического загрязнения, изменяя структуру сообществ. Эти изменения, наряду с перестройкой других водных ассамблей (микробных, фитопланктонных), напрямую зависят от экологической неоднородности, вызванной антропогенными факторами, такими как концентрация питательных веществ и органического углерода. Таким образом, мониторинг популяций пиявок предоставляет интегральную экологическую оценку загрязнения, существенно дополняя данные стандартного физико-химического анализа воды [3, 4].

Структура и разнообразие водных сообществ, включая такие виды рыб, как плотва обыкновенная (*Rutilus rutilus*), микроперцопс (*Micropercops cinctus*), амурский бычок (*Rhinogobius brunneus*), напрямую зависят от уровня органического и химического загрязнения. Например, снижение антропогенной нагрузки в речных системах способствует улучшению качества воды и изменению структуры ихтиоценоза в сторону более сложных и разнообразных форм, включая увеличение числа хищников. Эти загрязнители, нарушая физиологические процессы у рыб и изменяя микробные сообщества, лежащие в основе пищевой сети, вызывают каскадные изменения в трофических взаимодействиях «хищник–жертва» и перестраивают всю экосистему [5, 6].

Водные экосистемы, включая амфибий *Bufo viridis* и *Pelophylax ridibundus*, выступают в качестве биоиндикаторов загрязнения, поскольку их проницаемая кожа и сложный жизненный цикл делают их популяции чрезвычайно чувствительными к воздействию тяжёлых металлов, пестицидов и фармацевтических препаратов. Антропогенные стоки способствуют накоплению загрязняющих веществ, что непосредственно нарушает физиологические функции и репродуктивный успех амфибий, а также косвенно изменяет трофические цепи через влияние на микробные и беспозвоночные сообщества. Таким образом, изменения в видовом составе и

динамике популяций этих амфибий прямо отражают степень деградации качества воды и уровень химического загрязнения в водоёмах [8].

Сообщества водных насекомых, включая личинок стрекоз, ручейников и подёнок, чётко отражают градиенты органического и химического загрязнения, выступая надёжными биоиндикаторами. Чувствительные таксоны, такие как веснянки, исчезают в загрязнённых водоёмах, тогда как устойчивые группы, например хирономиды, увеличивают численность, что служит ключевым индикатором экологического состояния. Молекулярные методы, такие как ДНК-штрихкодирование, повышают точность оценки, а инновационные подходы, включая поляриметрию, дополняют традиционный мониторинг, создавая комплексный инструмент для оценки антропогенного воздействия [7].

Заключение: Изменения в структуре сообществ ключевых гидробионтов, таких как раки, рыбы, пиявки и амфибии, непосредственно указывают на уровень органического и химического загрязнения водоёмов. Совместный анализ этих биоиндикаторов с применением современных методов представляет собой мощный интегральный инструмент для оценки антропогенного воздействия и разработки природоохранных мер.

Использованные источники:

1. Grădinariu, L., Crețu, M., Vizireanu, C., & Dediu, L. (2025). Oxidative Stress Biomarkers in Fish Exposed to Environmental Concentrations of Pharmaceutical Pollutants: A Review. *Biology*, 14(5), 472. <https://doi.org/10.3390/biology14050472>
2. De Necker, L., Van Rooyen, D., Gerber, R., Brendonck, L., Wepener, V., & Smit, N. J. (2024). Effects of river regulation on aquatic invertebrate community composition: A comparative analysis in two southern African rivers. *Ecology and Evolution*, 14(2). <https://doi.org/10.1002/ece3.10963>
3. Hui, H., Liu, X., Wei, Y., Su, D., Zhou, H., & Peng, Z. (2024). Ecological assessment of water quality in freshwater wetlands based on the effect of environmental heterogeneity on phytoplankton communities in Northeast China. *PloS One*, 19(7), e0306321. <https://doi.org/10.1371/journal.pone.0306321>
4. Khan, N. A., Mir, Z. A., & Bakhtiyar, Y. (2024). The present state of leech fauna (Annelida: Hirudinea) in Dal Lake, Jammu & Kashmir, India. *Journal of Threatened Taxa*, 16(8), 25700–25711. <https://doi.org/10.11609/jott.8971.16.8.25700-25711>
5. Athulya, P., Prasad, P. V., Sivalingam, R., Sajeev, T. V., Kumar, C. S. R., & Syamkumar, R. N. P. (2024). Aquatic insects for monitoring the health status of riverine potholes: A case study in Chalakudy river basin, Kerala, India. *Environmental Monitoring and Assessment*, 196(2). <https://doi.org/10.1007/s10661-023-12254-x>
6. Gavrilas, S., Burescu, F.-L., Chereji, B.-D., & Munteanu, F.-D. (2025). The Impact of Anthropogenic Activities on the Catchment's Water Quality Parameters. *Water*, 17(12), 1791. <https://doi.org/10.3390/w17121791>

7. Menabit, S., Iancu, L., Pavel, A. B., Popa, A., Lupascu, N., & Purcarea, C. (2022). Molecular identification and distribution of insect larvae in the Lower Danube River. *Oceanological and Hydrobiological Studies*, 51(1), 74–89. <https://doi.org/10.26881/oahs-2022.1.07>
8. Dehon, E., Vrchovická, S., Mathieu, A., Favre-Bonté, S., Waławek, S., Droit, A., Vogel, T. M., & Sanchez-Cid, C. (2025). Impact of fluoroquinolone and heavy metal pollution on antibiotic resistance maintenance in aquatic ecosystems. *Environmental Microbiome*, 20(1). <https://doi.org/10.1186/s40793-025-00722-5>

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АГРОЭКОЛОГИЧЕСКАЯ РОЛЬ МАСЛИЧНЫХ КУЛЬТУР В СЕВООБОРОТЕ И ИХ ВЛИЯНИЕ НА ЭКОЛОГИЧЕСКОЕ СОСТОЯНИЕ ПОЧВ

***Аннотация:** Обзор анализирует агроэкологическую роль масличных культур в севообороте. Рассмотрено их влияние на свойства почвы, микробиоту, фитосанитарный потенциал и фиторемедиацию. Показано, что диверсификация севооборотов с масличными культурами повышает устойчивость агроэкосистем и сохраняет плодородие почвы, тогда как монокультура ведет к деградации. Необходима оптимизация агротехнологий для реализации полного почвозащитного потенциала.*

***Ключевые слова:** масличные культуры, севооборот, плодородие почвы, агроэкология, фиторемедиация, почвенная микробиота.*

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AGROECOLOGICAL ROLE OF OIL CROPS IN CROP ROTATION AND THEIR IMPACT ON THE ECOLOGICAL CONDITION OF SOILS

***Abstract:** The review analyzes the agroecological role of oilseed crops in crop rotation. Their impact on soil properties, microbiota, phytosanitary potential, and phytoremediation is considered. It is shown that diversifying crop rotations with oilseed crops enhances the resilience of agroecosystems and preserves soil fertility, whereas monoculture leads to degradation. Optimization of agrotechnologies is necessary to fully realize soil protection potential.*

***Keywords:** oilseed crops, crop rotation, soil fertility, agroecology, phytoremediation, soil microbiota.*

Введение: Интенсификация земледелия и деградация почв усиливают потребность в эффективных агроэкологических инструментах, где севооборот масличных культур важен для устойчивости агроценозов. Обзор систематизирует научные данные о влиянии подсолнечника и кунжута на

физико-химические, биологические и фитосанитарные характеристики почвы. Эти культуры являются не только экономически значимыми, но и активными фитомелиорантами, улучшающими состояние почвенного покрова.

Кунжут (*Sesamum indicum* L.) демонстрирует генотипическую вариабельность по устойчивости к засухе в системах сохранения почвенных ресурсов. Генотипы формируют адаптивные признаки, обеспечивающие стабильную урожайность при водном дефиците. Селекция засухоустойчивых сортов поддерживает продуктивность агроэкосистем. Применение калийных удобрений повышает содержание калия в почве и урожайность культуры. Подсолнечник (*Helianthus annuus* L.) обладает физиологическими и агроэкологическими преимуществами. Внесение фосфатных наноудобрений увеличивает продуктивность семян и устойчивость к водному стрессу. Растительные остатки подсолнечника выделяют фенольные соединения, подавляющие развитие сорных растений[1].

Масличные культуры (подсолнечник и кунжут) активно формируют микробиом ризосферы, который улучшает агрегацию почвенных частиц и уменьшает накопление солей. Такое взаимодействие растений и микроорганизмов ускоряет восстановление солонцеватых почв и повышает их агроэкологическое качество [3].

Диверсифицированные агросистемы с включением масличных и бобовых культур повышают урожайность по сравнению с традиционными рисо-пшеничными моделями земледелия. Эти биоинтенсивные системы усиливают ресурсосбережение, поскольку оптимизируют круговорот питательных веществ и повышают эффективность их использования в агроэкосистеме.

Исследования подтверждают, что подсолнечник (*Helianthus annuus*) и кунжут (*Sesamum indicum*) улучшают физико-химические свойства почвы. Растительные остатки подсолнечника увеличивают содержание органического вещества и формируют устойчивую структуру, повышая плодородие. Эти остатки выделяют фенольные соединения, изменяющие химический состав почвы и структуру микробных сообществ, подавляя сорняки. Биомасса подсолнечника стимулирует колонизацию корней микоризными грибами и ризобактериями, усиливая круговорот питательных элементов и мобилизацию фосфора [4].

Кунжут улучшает химические свойства почвы растительными остатками. Внесение кунжутного жмыха, богатого γ -полиглутаминовой кислотой, оптимизирует распределение элементов питания и повышает эффективность использования воды и азота, увеличивая урожайность. Разложение остатков кунжута повышает содержание органического вещества и активизирует микробиологические процессы, обеспечивая трансформацию питательных веществ.

Подсолнечник и кунжут проявляют высокую фиторемедиационную активность. Подсолнечник извлекает из почвы цинк и кадмий, снижая

техногенное загрязнение. Взаимодействуя с микробиотой, он усиливает удаление металлов и формирует биомассу для биоэнергии. Кунжут улучшает агрохимическое и экологическое состояние почвы, сокращая загрязняющие вещества.

Введение масличных культур в севооборот с хлопком и зерновыми укрепляет устойчивость агроэкосистем и снижает деградацию почвы через биоразнообразие и круговорот питательных веществ. Севооборот регулирует численность вредителей в экосистеме. Масличные культуры стимулируют микробное разнообразие и активность фило типов, улучшая биологическое состояние почвы [6,8].

Интенсивное выращивание подсолнечника и кунжута без применения научно обоснованных агротехнологий истощает влагу и питательные вещества в почве. Монокультура снижает содержание органического углерода и активность ферментов, что демонстрирует необходимость внедрения сбалансированных севооборотов для сохранения плодородия и биологической активности почвы [5,7,8].

Заключение: Интеграция масличных культур в севооборот повышает плодородие почвы, улучшает её физико-химические и биологические свойства и укрепляет фитосанитарное состояние агроценозов. Эффективное использование этих культур в устойчивом земледелии требует оптимизации севооборотов и внедрения обоснованных агротехнологий, которые предотвращают истощение ресурсов при длительном монокультурном возделывании.

Использованные источники:

1. Flayyih, T. M., & Almarie, A. A. (2023). Total Phenolic Exudation and Allelopathic Potential of Sunflower Residues as Sustainable Weed Management. *Iraqi Journal of Science*, 2215–2222. <https://doi.org/10.24996/ij.s.2023.64.5.10>
2. Fu, Y., Li, G., Wang, S., & Dai, Z. (2024). Effect of sesame cake fertilizer with γ -PGA on soil nutrient, water and nitrogen use efficiency. *Scientific Reports*, 14(1). <https://doi.org/10.1038/s41598-024-69650-7>
3. Nwachukwu, B. C., Ayangbenro, A. S., & Babalola, O. O. (2022). Effects of soil properties and carbon substrates on bacterial diversity of two sunflower farms. *AMB Express*, 12(1). <https://doi.org/10.1186/s13568-022-01388-9>
4. Paulo, A. M. S., Caetano, N. S., Castro, P. M. L., & Marques, A. P. G. C. (2023). Phytomanagement of Zn- and Cd-Contaminated Soil: *Helianthus annuus* Biomass Production and Metal Remediation Abilities with Plant-Growth-Promoting Microbiota Assistance. *Soil Systems*, 7(3), 69. <https://doi.org/10.3390/soilsystems7030069>
5. Carrascosa-Robles, Á., Pascual, J. A., Cuartero, J., De Santiago, A., Petropoulos, S. A., & Del Mar Alguacil, M. (2024). Optimizing purslane cultivation through legume intercropping and crop rotation: a study on yield and rhizosphere bacterial communities. *Plant and Soil*. <https://doi.org/10.1007/s11104-024-07061-3>
6. Huang, X., Yuan, J., Chen, Y., Yang, X., Lu, W., Ding, S., Jiang, Y., Zhou, X., Mi, G., Xu, J., & He, Y. (2024). Long-term cropping rotation with soybean enhances

soil health as evidenced by improved nutrient cycles through keystone phylotypes interaction. *Soil Ecology Letters*, 6(4). <https://doi.org/10.1007/s42832-024-0251-5>

7. Jat, R. S., Singh, H. V., Dotaniya, M. L., Choudhary, R. L., Meena, M. K., & Rai, P. K. (2024). Biological and Chemical Vicissitudes in Soil Rhizosphere Arbitrated under Different Tillage, Residues Recycling and Oilseed Brassica-Based Cropping Systems. *Sustainability*, 16(5), 2027. <https://doi.org/10.3390/su16052027>

8. Pushnya, M. V., Balakhnina, I. V., Kremneva, O. Y., Nesterova (Sobina), A. Y., & Snesareva, E. G. (2023). Crop rotation as a way to increase the biodiversity of agroecosystems and regulate the number of phytophages. *South of Russia: Ecology, Development*, 18(2), 113–126. <https://doi.org/10.18470/1992-1098-2023-2-113-126>

Оглавление

Abbasov A.A., ICHKI HARBIY NIZOLAR SHAROITIDA PSIXOLOGIK BARQARORLIK VA QARSHILIKNI MODELLASHTIRISH: JANGOVAR TA'MINOTNING YANGI KONSEPSIYASI	10
Abdiraximova Sh.K., INTEGRATSION YONDASHUV HAMDA KASB-HUNARNING MOHIYATI VA NAZARIY JIHATDAN TAHLILI	15
Abdisattarova S.P., Tangirov X.T., BO'LAJAK BIOLOGIYA FANI O'QITUVCHILARINING KASBIY TAYYORGARLIGINI TAKOMILLASHTIRISH (QUSHLAR SINFI MISOLIDA)	19
Abdullayev S.I., Omonullayev O., GEOSISTEMALARNING TUZILMASI	23
Abdunazarov S.A., Shamsiyeva D. A., HUDUDLARNING INVESTITSION SIYOSATINI TAKOMILLASHTIRISH ZARURATI VA USTUVOR YO'NALISHLARI (Jizzax viloyati misolida).....	29
Abdurakhmonov.S., Rakhimov I. B., Nazarova.D., PEDAGOGICAL SIGNIFICANCE OF ENVIRONMENTAL VALUES IN ENSURING CONTINUITY OF EDUCATION AND UPBRINGING	33
Abdurakhmonov S., Rakhimov I. B., Ikromaddinova D.K., MODERN DIRECTIONS FOR MODERNIZING GEOGRAPHY EDUCATION BASED ON FOREIGN COUNTRIES' EXPERIENCE (ON THE EXAMPLE OF HIGHER EDUCATION INSTITUTIONS)	38
Abduraxmanov S.Sh., Usmonov N.O., ФАВҚУЛОДДА ВАЗИЯТЛАР ПРОФИЛАКТИКАСИНИ РАҚАМЛАШТИРИШНИНГ МОНИТОРИНГИ ВА ПРОГНОЗЛАШДАГИ МОҲИЯТИ	44
Alimova R.B., THE INDEPENDENCE OF THE ACCOUNTING CHAMBER AS A FACTOR IN THE EFFECTIVENESS OF STATE FINANCIAL CONTROL: INTERNATIONAL STANDARDS AND NATIONAL PRACTICE	49
Axmedov A.Z., A'zamov S.S., ANALYSIS OF ENERGY EFFICIENCY INDICATORS OF SOLAR POWER SUPPLY SYSTEMS	57
Bebutova Z.H., TOSHKENT VILOYATI FERMER XO'JALIKLARIDA MAHSULOT (ISH, XIZMATLAR) YETISHTIRISH JARAYONLARINI STATISTIK BAHOLASH.....	60
Botirov A. A., DEVELOPMENT OF A MECHATRONIC SYSTEM FOR SELECTING WATER TEMPERATURE IN SILK REELING PROCESS	69
Botirov A. A., DEVELOPMENT OF ULTRASONIC TECHNOLOGY USING MECHATRONIC SYSTEMS IN THE COCOON REELING PROCESS	72
Damirova Y.U., TERMIZ SHAROITIDA ROSMARINUS OFFICINALIS L. O'SISHI VA RIVOJLANISHINING EKOLOGIK ASOSLARI.....	75
Darmonov A.A., MECHANISMS OF SOCIAL CONTROL IN FORMING A SENSE OF RESILIENCE AMONG YOUTH IN UZBEKISTAN.....	79

Djuraeva G. X., Ismatov B.A., Barotova N.A., PARAFIN UGLEVODORODLARINING IZOMERIZATSIYA REAKTSIYALARIDA VODORODNING AHAMIYATI	82
Dushamova M.X., Nematova G.G', ADABIYOT DARSLARIDA LOYIHA ASOSIDA TA'LIM ORQALI O'QUVCHILARNING TAHLILY YOZUV KOMPETENSIYASINI RIVOJLANTIRISH	86
Ergashev T.A., Soliyev D.Z., Raimova Z.O., CHIZMACHILIK FANLARINI O'QITISHDA KOMPYUTER GRAFIK TEXNOLOGIYALARIDAN FOYDALANISHNING PEDAGOGIK SAMARADORLIGI.....	90
Ergasheva M. F., Shomurodova M. O., Ergasheva M. T., HYPERTENSION AND PREECLAMPSIA: CLINICAL AND PATHOGENETIC RELATIONSHIPS	98
Erkinova M. R., YOSHLARDA MA'NAVY-AXLOQIY TARBIYA MAZMUNI	102
Eshboyev B.T., Dilmurodov O. U., DESCRIPTION OF ORE AND NORUDA MINERALS OF THE SOUTHWESTERN HISSAR REGION	106
Esonov O.A., OILA MUHITIDA OTA-ONA MUNOSABATLARINING BOLA SHAXSINI SHAKLLANTIRISHDAGI ROLI	111
Irgashev M.U., WHY TIME MANAGEMENT IS IMPORTANT FOR STUDENTS IN LEARNING A FOREIGN LANGUAGE.....	114
Ismoilov A.I., Zokirova I.Z., PO'LAT O'TKAZGICHLI TARMOQLARDA QISQA TUTASHUV TOKLARINI HISOBLASH	118
Ismatullayeva Sh. N., TRADE FACILITATION THROUGH AEO MUTUAL RECOGNITION ARRANGEMENTS: EVIDENCE FROM THE LOGISTICS PERFORMANCE INDEX.....	123
Ismoilova O.A`, INTERNETDAGI FOYDALANUVCHI SHARHLARIDA INFORMATIVLIK VA UNING LINGVOPRAGMATIK TAHLILI.....	131
Jienbaev M., THE MOTIF OF REMEMBRANCE IN LYRIC POETRY EXEMPLIFIED THROUGH THE LYRICS OF S. IBRAGIMOV AND A. AXMATOVA	135
Jonibekov J. J., EFFECT OF THYROID AUTOIMMUNITY ON RENAL STRUCTURAL CHANGES: CT AND US IMAGING INSIGHTS	139
Jumaboyeva O. I., THE DEVELOPMENT OF TOURISM IN THE MODERN ERA.....	144
Karimullin D.D., ASSESSMENT OF TRAINING NEEDS OF AUTO HOLDING PERSONNEL.....	147
Khakimova Kh. Kh., Ismoilova M. Sh., THE ROLE OF MARKETING MANAGEMENT IN STRENGTHENING PUBLIC HEALTH PROTECTION SYSTEMS.....	151

Kurbanova M. T., ON THE ISSUE OF ORGANISING INDEPENDENT LEARNING ACTIVITIES OF SCHOOLCHILDREN IN THE STUDY OF THE RUSSIAN LANGUAGE	157
Kurbanova M.T., SCIENTIFIC AND THEORETICAL FOUNDATIONS AND METHODOLOGICAL ASPECTS OF THE COMPETENCY-BASED APPROACH IN HIGHER EDUCATION	160
Kurbonova I.M., SUN'IIY INTELLEKTNING (SI) TA'LIMDAGI O'RNI. IMKONIYATLARI VA KAMCHILIKLARI	163
Majidov F.I., INTELLEKTUAL MULK VA KAPITAL TUSHUNCHASI.....	166
Majidov F.I., INTELLEKTUAL MULKNI XALQARO HUQUQIY HIMOYA QILISH MASALALARI	170
Mavlonova R.M., O'QUVCHI YOSHLARNI KASB-HUNARGA YO'NALTIRISHDA XALQ HUNARMANDCHILIGINING AHAMIYATI....	173
Ne'matova M.Z., PREDICTION OF PREECLAMPSIA DEVELOPMENT IN PREGNANT WOMEN AFTER IN VITRO FERTILIZATION	176
Obilqosimov M., Tajibayev M.A., HOZIRGI KUNDA TURIZMNING RIVOJLANISHI	182
Obilqosimov M., Tajibayev M.A., WEB-INTERFEYSLARNI AVTOMATLASHTIRILGAN BOSHQARUV TIZIMLARIGA INTEGRATSIYA QILISH MEKANIZMLARI	186
Poshaxodjaeva G. J., Umarov U. U., Xojamkulov A. X., IMPROVING THE IMPACT OF DIGITAL FINANCIAL TECHNOLOGIES ON THE TRANSFORMATION OF BANKING SERVICES IN THE REPUBLIC OF UZBEKISTAN.....	189
Primova O` . N., Ruzimuratova G.Sh., TEXNIKUM O'QUVCHILARIDA ALGORITMIK FIKRLASHNI SHAKLLANTIRISHDA BLOK-SXEMA VA PSEVDOKODDAN FOYDALANISH METODIKASI	192
Pulatova G.I., TOPIC: THE INTRODUCTION AND POPULARIZATION OF TECHNICAL EQUIPMENT INTO THE LIFE OF THE POPULATION IN THE UZBEK SSR AND KARAKALPAK ASSR IN THE SECOND HALF OF THE 20TH CENTURY	196
Quvvatova M.H., Otaxo'jayeva B.B., MAKTABGACHA YOSHDAGI BOLALARDA MATEMATIK TASAVVURLARNI SHAKLLANTIRISHDA STEAM YONDASHUVIDAN FOYDALANISHNING AFZALLIKLARI	201
Quvvatova M.H., Xasanova M.B., 6–7 YOSHLI TARBIYALANUVCHILARDA MUSTAQIL FIKRLASH KO'NIKMALARINI RIVOJLANTIRISHDA MUAMMOLI TA'LIM USULLARINING AHAMIYATI	204

Quvvatova M.H., Asatova S.A., KOMMUNIKATIV O‘YINLAR ORQALI O‘RTA MAKTABGACHA YOSHDAGI BOLALAR NUTQNI RIVOJLANTIRISH TEXNOLOGIYASI.....	208
Rahimjonov Sh. A., KICHIK SHAHARLAR REKONSTRUKSIYASIDA QAROR QABUL QILISHDAGI INSTITUTIONAL VA IJTIMOIIY TO‘SIQLAR.....	212
Razikova D., IMMUNOLOGICAL CHANGES AND THERAPEUTIC APPROACHES IN HERPETIC STOMATITIS	218
Ruziyev Z.M., CYTOKINE-MEDIATED SUPPRESSION OF MEGAKARYOCYTOPOIESIS (TNF-A, IL-6, IL-1B)	221
Safarov I.B., Abdujalilov R., TRANSCHEGARAVIY EKOLOGIK MUAMMOLAR: OROL DENGIZI INQIROZI VA CHO‘LLANISH JARAYONI.....	225
Sagdiyev M., Muqimov M., Musayev N., Gulyayeva G., LASTIK TO‘QIMASI ASOSIDA OLINGAN YANGI TUZILISHDAGI PALTOBOP TRIKOTAJ TO‘QIMALARINING FIZIK-MEXANIK XUSUSIYATLARI TAHLILI	229
Sagdiyev M., Muqimov M., Musayev N., Hazratqulov H., LASTIK TO‘QIMASI ASOSIDA OLINGAN YANGI TUZILISHDAGI PALTOBOP TRIKOTAJ TO‘QIMALARINING TEXNOLOGIK KO‘RSATKICHLARINI TAHLILI ...	233
Saidmurodova J.B., Samadova D., APPLICATION OF SEBIDIN IN THE PREVENTION OF PERIODONTITIS IN ADOLESCENTS	237
Saidova N. S., RENAL FIBROSIS IN CHRONIC KIDNEY DISEASE: RADIOLOGICAL IMAGING MARKERS AND PREDICTIVE VALUE	241
Saidova N. S., IMAGING PREDICTORS OF RENAL FIBROSIS IN CHRONIC KIDNEY DISEASE: ULTRASOUND AND MULTISLICE COMPUTED TOMOGRAPHY ASSESSMENT.....	246
Saidova G.E., Itolmasova O.S., BOSHLANG‘ICH TA‘LIMDA XALQARO BAHOLASH TALABLARIGA MOS O‘QUV TOPSHIRIQLARINI ISHLAB CHIQISH	252
Shadieva Sh.Sh., REFLECTION OF SPIRITUAL PROBLEMS OF RUSSIAN SOCIETY IN RUSSIAN PROSE.....	256
Shadjanova N.S., SPECIFIC FEATURES OF THE MECHANISMS REGULATING SYSTEMIC HEMODYNAMICS IN WOMEN OF REPRODUCTIVE AGE.....	260
Shertaylaqov G` . M., Mamayaqubova M.N., ZAMONOVIIY O`LCHOV VOSITALARINI SERTIFIKATLASHTIRISHGA DOIR XALQARO STANDART MEYORLARI	264
Shertaylaqov G`.M., Bo‘ronov N. G‘., RAQAMLI AMPERMETRLARNING METROLOGIK XUSUSIYATLARI	267

Shodiev S. R., Ruziyev J. A., Sayfiyeva U.A., INLAND WATERS OF NAVAI REGION AND THEIR NATURAL GEOGRAPHICAL SIGNIFICANCE.....	272
Sultonov Sh.A., Qosimova Z. G‘., Omonova R. P., MAKTABGACHA TA’LIMDA EKOLOGIK TARBIYA MASALALARINING YORITILISHI....	277
Tinibekov M.X., Raximov S.Sh., AHOLINI FAVQULODDA VAZIYATLARDA HARAKAT QILISHGA TAYYORLASHDA INNOVATSION TIZIMLARINING JORIY ETILISH TARIXI.....	283
Tolepov E.T., Genjemuratova U. T., ULÍWMA ORTA BILIM BERIW MEKTEPLERINDE EKONOMIKALÍQ PÁNLERDI OQÍTÍWDA INTERAKTIV METODLARDAN PAYDALANIWDIŇ ÓZINE TÁNLIĞI....	289
Tursoatov P.X., Abdurahmonov S.Sh., Mengliyev G‘.A., KUYDIRGI KASALLIGI BO‘YICHA EPIZOOTIK HOLATNI NAZORAT QILISH VA OLDINI OLIISHDA TADBIRLARI.....	294
Tursunova R.R., MAKTABGACHA TA’LIM TASHKILOTIDA INKLYUZIV TA’LIMMI TASHKIL ETISH YO‘LLARI	302
Tuyunbayeva L., Murotov N., CHALLENGES IN CLINICAL LABORATORY IMPLEMENTATION OF PCR: A COMPREHENSIVE ANALYSIS	305
Umarova G.K., Umarova M. Sh., KICHIK KORXONA UCHUN LOKAL TARMOQNI LOYIHALASH VA AXBOROT XAVFSIZLIGINI TA’MINLASHNING AMALIY YECHIMLARI	309
Umurzakov D.B., MANAGING STUDENTS' INDEPENDENT WORK IN THE EDUCATIONAL ENVIRONMENT	313
Uvarov D.R., THE WORKS OF DMITRY GLUKHOVSKY IN THE CONTEXT OF CONTEMPORARY RUSSIAN LITERATURE	317
Yakubov S., TAXATION OF INDIVIDUAL ENTREPRENEURSHIP AND SELF-EMPLOYMENT INCOME: FUNDAMENTAL PRINCIPLES, INSTITUTIONAL DESIGN	320
Yusupov O.B., SUN’IY INTELLEKTNING NAZARIY ASOSLARI VA AMALIY AHAMIYATI	331
Zaynalov J. R., Xasanov Sh.X., APPLYING FOREIGN PRACTICES IN THE EFFICIENT USE OF CREDIT FUNDS IN MANUFACTURING ENTERPRISES.....	335
Zikirov I. Y., Kenjayev A.A., Aripov I.K., SIRDARYO VILOYATI SUG‘ORILADIGAN HUDUDLARIDA TABIIY–MELIORATIV SHAROIT VA TUPROQ SHO‘RLANISHINING HUDUDIIY XUSUSIYATLARI	340
Абдулова И.С., ОСОБЕННОСТИ ДИНАМИКИ ГРУППОВЫХ ПРОЦЕССОВ В КОНСУЛЬТАТИВНЫХ ГРУППАХ ЛИЧНОСТНОГО РОСТА.....	345
Абдуназаров С. А., СОВЕРШЕНСТВОВАНИЕ СТРАТЕГИИ ПОДДЕРЖКИ МАЛОГО БИЗНЕСА И ЧАСТНОГО ПРЕДПРИНИМАТЕЛЬСТВА	349

Атаханов Ш.Э., Нишанов Д.А., Умарова К.А., МОРФОЛОГИЧЕСКИЕ ОСОБЕННОСТИ ПЛАЦЕНТЫ ПРИ МАТЕРИНСКОЙ СМЕРТНОСТИ	353
Ашурметова Н.А., ЗЕЛЕНАЯ ТРАНСФОРМАЦИЯ АГРАРНОГО СЕКТОРА: ТЕНДЕНЦИИ И ДОСТИЖЕНИЯ	366
Беляков Д. Д., СНИЖЕНИЕ УРОВНЯ АКТИВНОСТИ У ДЕТЕЙ: АНАЛИЗ СОВРЕМЕННЫХ ТЕНДЕНЦИЙ	375
Бердибекова С.К., СОЦИАЛЬНЫЕ ГРУППЫ КАК ФАКТОР ФОРМИРОВАНИЯ ЛИЧНОСТИ И ОБЩЕСТВЕННЫХ ОТНОШЕНИЙ ...	391
Джураев У. Д., ПРИНЦИПЫ И МЕТОДЫ УПРАВЛЕНИЯ ИНВЕСТИЦИЯМИ В ЧЕЛОВЕЧЕСКИЙ КАПИТАЛ В УСЛОВИЯХ ИННОВАЦИОННОГО РАЗВИТИЯ ОРГАНИЗАЦИИ	395
Джураева Г.Х., Самадов А.Х., Мейлиева М.Ш., Исмаев Б.А., МЕТОДЫ ПЕРЕРАБОТКИ НЕФТЯНЫХ УГЛЕВОДОРОДОВ	401
Жамолдинова С. А., Юсупалиев Б.Н., НЕОЛОГИЗМЫ ХХІ ВЕКА И ИХ РОЛЬ В РАЗВИТИИ РУССКОГО ЯЗЫКА	406
Жекшенова Д.А., ГИБКОСТЬ КАДРОВОЙ ПОЛИТИКИ КАК УСЛОВИЕ УСТОЙЧИВОГО РАЗВИТИЯ ОРГАНИЗАЦИИ	413
Закирова И.З., ИСПОЛЬЗОВАНИЕ АСИНХРОННОГО ГЕНЕРАТОРА В МИКРОГИДРОЭЛЕКТРОСТАНЦИЯХ	419
Иброимов Ш., ЗАКОНОМЕРНОСТЬ ПОВЕРХНОСТНЫХ ВОДНЫХ ПОТОКОВ В ДЕЛЬТОВЫХ ГЕОСИСТЕМАХ.....	422
Исаков М.У., Мирзаев А.А., Мўминов Р. Қ., РАННЯЯ НЕЙРОПСИХОЛОГИЧЕСКАЯ ДИАГНОСТИКА И ИНТЕРВЕНЦИЯ У ДЕТЕЙ ИЗ ГРУПП ГЕНЕТИЧЕСКОГО РИСКА, РОЖДЁННЫХ В УСЛОВИЯХ БЛИЗКОРОДСТВЕННОГО БРАКА	426
Камолова Д.Ж., ГИПЕРТОНИЧЕСКАЯ БОЛЕЗНЬ И ПРЕЭКЛАМПСИЯ: КЛИНИКО-ПАТОГЕНЕТИЧЕСКИЕ ВЗАИМОСВЯЗИ	434
Каппушев М.А., ПУТИ СОВЕРШЕНСТВОВАНИЯ ПРИНЦИПОВ АДРЕСНОСТИ В СОЦИАЛЬНОЙ ЗАЩИТЕ НАСЕЛЕНИЯ КАРАЧАЕВО-ЧЕРКЕССКОЙ РЕСПУБЛИКИ (НА ПРИМЕРЕ ВЕТЕРАНОВ И СЕМЕЙ УЧАСТНИКОВ СВО).....	438
Каюмова Н. А., Героева О. О., МЯГКИЕ НАВЫКИ В ПРЕПОДАВАНИИ	445
Киличева В.А., ГОРМОНАЛЬНЫЙ И БИОХИМИЧЕСКИЙ ПРОФИЛЬ ФОЛЛИКУЛЯРНОЙ ЖИДКОСТИ КАК МАРКЕР КАЧЕСТВА ООЦИТОВ У ЖЕНЩИН С СИНДРОМОМ ПОЛИКИСТОЗНЫХ ЯИЧНИКОВ	450
Кузнецова Д.В., СТРАТЕГИИ И МЕРЫ СОВЕРШЕНСТВОВАНИЯ БЮДЖЕТНОЙ ПОЛИТИКИ КАРАЧАЕВО-ЧЕРКЕССИИ ДЛЯ ОБЕСПЕЧЕНИЯ ЭКОНОМИЧЕСКОЙ СТАБИЛЬНОСТИ РЕСПУБЛИКИ	455

Маткосимов М.М., АНАЛИЗ ДИНАМИЧЕСКИХ РЕЖИМОВ РАБОТЫ АСИНХРОННОГО ГЕНЕРАТОРА МИКРОГЭС.....	463
Махамаджонов С. Ю., АВТОНОМНАЯ МИКРОГЭС НА БАЗЕ АСИНХРОННОГО ГЕНЕРАТОРА С PID-РЕГУЛИРОВАНИЕМ	466
Мирзаев А.А., Муминов Р. К., Азимова Г. А., ИНТЕГРАТИВНАЯ ТЕРАПИЯ ПСИХОСОМАТИЧЕСКИХ РАССТРОЙСТВ В АМБУЛАТОРНОЙ ПРАКТИКЕ: МУЛЬТИДИСЦИПЛИНАРНЫЙ ПОДХОД И КЛИНИКО-ПСИХОЛОГИЧЕСКАЯ ЭФФЕКТИВНОСТЬ	469
Мухаммадиев Б.С., Раббимова Н.З., МЕТРОЛОГИЧЕСКОЕ ОБЕСПЕЧЕНИЕ ОТРАСЛЕЙ НАРОДНОГО ХОЗЯЙСТВА.....	478
Назирова З.М., ОПТИМИЗАЦИЯ АЛГОРИТМА ДИАГНОСТИКИ ГИПЕРПЛАЗИИ ЭНДОМЕТРИЯ: РОЛЬ ТРАНСВАГИНАЛЬНОГО УЗИ И ГИСТЕРОСКОПИИ С ПРИЦЕЛЬНОЙ БИОПСИЕЙ	482
Намозова Д.Т., Абдураимова Б.Д., ИНТЕГРАТИВНЫЕ ВОЗМОЖНОСТИ МЕТОДИЧЕСКИХ НАУК В РАЗВИТИИ ПРОФЕССИОНАЛЬНОЙ КОМПЕТЕНТНОСТИ ПРЕПОДАВАТЕЛЕЙ МУЗЫКАЛЬНОЙ КУЛЬТУРЫ	491
Негматшаева Х. Н., ОПТИМИЗАЦИЯ ВЕДЕНИЯ БЕРЕМЕННЫХ С ПРЕЭКЛАМПСИЕЙ НА ОСНОВЕ КОМПЛЕКСНОЙ ОЦЕНКИ ГЕМОДИНАМИЧЕСКИХ И ЛАБОРАТОРНЫХ ПОКАЗАТЕЛЕЙ	497
Низамов Ж. А., Холияров Ж. О., ПОВЫШЕНИЕ ЭФФЕКТИВНОСТИ ВЕНТИЛЯЦИОННЫХ СИСТЕМ НА ПРОМЫШЛЕННЫХ ПРЕДПРИЯТИЯХ.....	505
Низамов Ж. А., Пардаев Ш. Ф., ПРОЕКТИРОВАНИЕ ЭЛЕКТРИЧЕСКИХ ЧАСТЕЙ ФРЕЗЕРНОГО СТАНКА.....	509
Одилова С., Раимкулова З., МИКРОБИОЛОГИЧЕСКИЙ АНАЛИЗ ФИЛЬТРОВ КОНДИЦИОНЕРОВ В АУДИТОРИЯХ	513
Омонтурдиев А.М., Нормуродов С.О., ДИНАМИЧЕСКИЙ АНАЛИЗ ПОСЕВНЫХ ПЛОЩАДЕЙ СЕЛЬСКОГО ХОЗЯЙСТВА В СУРХАНДАРЬИНСКОЙ ОБЛАСТИ	517
Омонтурдиев А.М., Чориева У.Х., ТЕРРИТОРИАЛЬНЫЙ АНАЛИЗ ЭКОЛОГИЧЕСКОГО СОСТОЯНИЯ СУРХАНДАРЬИНСКОЙ ОБЛАСТИ.....	526
Позилова Ш.Х., Бултакова Ф.Т., СОВЕРШЕНСТВОВАНИЕ МЕТОДИКИ ИСПОЛЬЗОВАНИЯ ЦИФРОВЫХ И AI-ИНСТРУМЕНТОВ ДЛЯ ПОВЫШЕНИЯ УРОВНЯ КОМПОЗИЦИОННОГО МЫШЛЕНИЯ СТУДЕНТОВ ВУЗОВ.....	533
Прокофьева А. С., Прокофьева М. С., ПРИМЕНЕНИЕ D-BUS ДЛЯ УПРАВЛЕНИЯ GNOME В ОС АЛЬТ. ВОПРОСЫ БЕЗОПАСНОСТИ	537

Равшанбекова Д.А., Курбанов А.К., РОЛЬ НАСЛЕДСТВЕННЫХ ФАКТОРОВ В ПРОЯВЛЕНИИ И РИСКЕ РАЗВИТИЯ ЗАБОЛЕВАНИЙ ПЕЧЕНИ.....	548
Равшанова Х.С., Амиров О.Ю., НАВИГАЦИОННАЯ ХИРУРГИЯ В ЧЛХ: ТОЧНОСТЬ УСТАНОВКИ СКУЛОВЫХ ИМПЛАНТАТОВ В УСЛОВИЯХ ВЫРАЖЕННОЙ АТРОФИИ	551
Рахимова М.Ф., ЖАНР ФЭНТЕЗИ В РУССКОЙ И УЗБЕКСКОЙ ЛИТЕРАТУРЕ	558
Рахимова М.С., ПСИХОЛОГИЧЕСКАЯ АДАПТАЦИЯ ДЕТЕЙ ДОШКОЛЬНОГО ВОЗРАСТА В УСЛОВИЯХ ИНКЛЮЗИВНОГО ОБРАЗОВАНИЯ	561
Романова С.А., ОСОБЕННОСТИ ПСИХОЛОГИЧЕСКОГО КОНСУЛЬТИРОВАНИЯ КЛИЕНТОВ С ИПОХОНДРИЕЙ И СТРАХОМ БОЛЕЗНИ.....	566
Рустамов Н.Т., Мухаммадиев Б.С., НАКОПЛЕНИЕ ЭНЕРГИИ И ЕЁ ХРАНЕНИЕ В ЭНЕРГОСИСТЕМЕ.....	570
Салиев М.М.-А., Азимова Г. А., Муминов Р.К., ИНТЕГРАТИВНЫЕ МЕТОДЫ ПСИХОТЕРАПИИ В ЛЕЧЕНИИ ПОСТТРАВМАТИЧЕСКОГО СТРЕССОВОГО РАССТРОЙСТВА У ВЗРОСЛЫХ: КЛИНИЧЕСКАЯ ЭФФЕКТИВНОСТЬ И СТРАТЕГИИ ВМЕШАТЕЛЬСТВА.....	577
Салихова А. А., Худойберганаева С.Т., ФОРМИРОВАНИЕ ПРОФЕССИОНАЛЬНЫХ НАВЫКОВ У СТУДЕНТОВ КОЛЛЕДЖЕЙ	583
Степнова М.И., ПСИХОГИГИЕНА КАК ОДИН ИЗ ОБЯЗАТЕЛЬНЫХ ПРОФЕССИОНАЛЬНЫХ НАВЫКОВ ЧЕЛОВЕКА В УСЛОВИЯХ ШИРОКОГО РАСПРОСТРАНЕНИЯ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА	587
Тураев Ф.Х., НАУЧНОЕ ОБОСНОВАНИЕ СОДЕРЖАНИЯ БОЕВОЙ И ФИЗИЧЕСКОЙ ПОДГОТОВКИ СОТРУДНИКОВ ПРАВООХРАНИТЕЛЬНЫХ ОРГАНОВ ПРИ ЗАДЕРЖАНИИ ПОДОЗРЕВАЕМЫХ.....	592
Турдиева О.М., Каххорова Ф.К., ФУНКЦИЯ ПЕЧЕНИ, РОЛЬ МИТОХОНДРИЙ В БИОЭНЕРГЕТИКЕ КЛЕТОК ПЕЧЕНИ.....	597
Турсунова Л. К., МОДЕЛЬ РАЗВИТИЯ ПРОФЕССИОНАЛЬНОЙ КОМПЕТЕНТНОСТИ СТУДЕНТОВ НА ОСНОВЕ ТЕХНОЛОГИИ SCRIBING	604
Хайдаров Х. М., ВЛИЯНИЕ ПОЛИТИКИ ЭНЕРГОСБЕРЕЖЕНИЯ НА ЭКОНОМИЧЕСКУЮ УСТОЙЧИВОСТЬ ПРОМЫШЛЕННЫХ ПРЕДПРИЯТИЙ	619

Хайдаров Х.М., ЭКОНОМИЧЕСКИЕ ОСНОВАНИЯ АНАЛИЗА ПОТЕРЬ ЭНЕРГИИ В ПРОМЫШЛЕННЫХ НАСОСНЫХ СИСТЕМАХ И ВНЕДРЕНИЯ ЭНЕРГОСБЕРЕГАЮЩИХ ТЕХНОЛОГИЙ.....	622
Хакимова О.Н., КЛАССИФИКАЦИЯ ЭЛЕМЕНТАРНЫХ ГЕОХИМИЧЕСКИХ ЛАНДШАФТОВ	626
Хатамов И.У., СИНОНИМИЧЕСКИЕ ОТНОШЕНИЯ УЗБЕКСКИХ И РУССКИХ ПОСЛОВИЦ	630
Холиков К.Т., АНАЛИЗ ПРОБЛЕМ ОБУЧЕНИЯ ТЕМАМ МАГНИТНОГО ПОЛЯ И ДИДАКТИЧЕСКАЯ МОДЕЛЬ.....	634
Хомидова С.Х., ИЗМЕНЕНИЕ МИКРОФЛОРЫ ЗЕРНА ПШЕНИЦЫ, ХРАНЯЩЕЙСЯ НА СКЛАДАХ, В ПОСЛЕУБОРОЧНЫЙ ПЕРИОД	653
Худойбердиева Б.Э., Курбанов А.К., МОЛЕКУЛЯРНАЯ КОММУТАЦИЯ КАК НОВЫЙ МЕХАНИЗМ ХРАНЕНИЯ И ПЕРЕДАЧИ ИНФОРМАЦИИ В НУКЛЕИНОВЫХ КИСЛОТАХ	665
Чакилова М. С., Лукин А. Н., РОЛЬ РУССКОГО ЯЗЫКА В ОСВОЕНИИ ЭКОНОМИЧЕСКИХ ДИСЦИПЛИН И ПРОФЕССИОНАЛЬНОЙ ТЕРМИНОЛОГИИ.....	670
Шермухамедов А. Б., Пошаходжаева Г. Д., ФИКТИВНЫЙ ПУНКТ В ТРАНСПОРТНОЙ ЗАДАЧЕ: МАТЕМАТИЧЕСКИЙ ПРИЁМ И ЕГО ЭКОНОМИЧЕСКАЯ ИНТЕРПРЕТАЦИЯ.....	676
Эгамова М.Т., Расулов Ж.Ш., СПЕЦИФИКА РЕАБИЛИТАЦИИ ДЕТЕЙ С ОГРАНИЧЕННЫМИ ВОЗМОЖНОСТЯМИ	683
Эгамова М.Т., ПОЛОЖИТЕЛЬНОЕ ВЛИЯНИЕ ФИЗИЧЕСКИХ НАГРУЗОК НА ОРГАНИЗМ РЕБЕНКА С ИНВАЛИДНОСТЬЮ	687
Эргашев О., ОСОБЕННОСТИ СОЗДАНИЯ СПЕЦИАЛЬНЫЕ ЭКОНОМИЧЕСКОЙ ЗОНЫ В РЕГИОНЕ	691
Эргашев О., ЦЕЛИ СОЗДАНИЯ СПЕЦИАЛЬНЫЕ ЭКОНОМИЧЕСКОЙ ЗОНЫ В РЕГИОНЕ.....	698
Эшбоев Б.Т., Нематуллаева А.И., МИЛЛИЙ БОҒ ВА ҚУРИКХОНА, БУҲУРТМАЛАРНИНГ ТАБИАТНИ МУҲОФАЗА ҚИЛИШДАГИ ЎРНИ ВА АҲАМИЯТИ.....	704
Юлдашева А. С., РАЦИОНАЛИЗАЦИЯ ТАКТИКИ ВЕДЕНИЯ ПАЦИЕНТОК С АНОМАЛЬНЫМИ МАТОЧНЫМИ КРОВОТЕЧЕНИЯМИ РЕПРОДУКТИВНОГО ВОЗРАСТА	710
Юнусов Д.М., КЛИНИЧЕСКАЯ ЭФФЕКТИВНОСТЬ ПЕРСОНАЛИЗИРОВАННЫХ ПРОГРАММ ДИСПАНСЕРНОГО НАБЛЮДЕНИЯ ДЕТЕЙ РАННЕГО ВОЗРАСТА.....	719
Юсубалиев У.А., ИСКУССТВО ЗАЩИТЫ: ПОЛНОЕ РУКОВОДСТВО ПО УХОДУ ЗА КОЖЕЙ В ЗИМНИЙ ПЕРИОД	727

ЗДРАВООХРАНЕНИЕ В ОБЩЕСТВЕ 731

Bektashev B. B., THE IMPACT OF THE INTERNATIONAL PISA ASSESSMENT PROGRAM ON THE NATIONAL EDUCATION SYSTEM .731

Қурбонов М.К., ҚАНДЛИ ДИАБЕТ 1-ТУРИ ФОНИДА РИВОЖЛАНГАН ЎТКИР ЙИРИНГЛИ ЎРТА ОТИТНИНГ КЛИНИК ХУСУСИЯТЛАРИ ВА ЛАБОРАТОР ВА ИНСТРУМЕНТАЛ КўРСАТКИЧЛАРИ БАХОЛАШ 734

Mardonova Kh. Sh., Achilova D.N., CLINICAL COURSE CHARACTERISTICS AND PREDICTION OF COMPLICATIONS IN NEONATAL INFECTIONS.740

Mukhamedova Sh.T., GESTATIONAL AGE AS A DETERMINANT OF GUT MICROBIOTA MATURATION AND SERUM MAGNESIUM IN NEWBORNS 745

Rasulova O.N., Mukhamedova Sh.T., THE IMPORTANCE OF CAFFEINE CITRATE USE IN PRETERM INFANTS WITH RESPIRATORY DISTRESS SYNDROME 754

Shamsiyeva N. S., ETIOLOGICAL FACTORS OF VITAMIN D DEFICIENCY IN CHILDREN 757

Абдуллаева М.А., Азимджонова Ш., ЁШЛАРДА УЧРАЙДИГАН ЮВЕНИЛ ЮРАК ЕТИШМОВЧИЛИГИ (АДАБИЁТЛАР ШАРҲИ) 762

Ахмедова Н. М., Юлдашева Х. У., ВЗАИМОСВЯЗЬ ГОРМОНАЛЬНЫХ И МЕТАБОЛИЧЕСКИХ НАРУШЕНИЙ ПРИ ГИПЕРАНДРОГЕННОМ СИНДРОМЕ 766

Джумаева Ш.Д., ПЕРВИЧНЫЕ ИММУНОДЕФИЦИТЫ В РЕСПУБЛИКЕ УЗБЕКИСТАН: КЛИНИКО-ЭПИДЕМИОЛОГИЧЕСКИЙ АНАЛИЗ 770

Динмухаммадиева Д. Р., Холтаева Ф.Ф., ИНТЕГРАЦИЯ ПСИХОДИАГНОСТИЧЕСКИХ И ГИСТОЛОГИЧЕСКИХ МЕТОДОВ ДЛЯ ОЦЕНКИ КОГНИТИВНЫХ, ЛИЧНОСТНЫХ И АДАПТАЦИОННЫХ ХАРАКТЕРИСТИК ОБУЧАЮЩИХСЯ В МЕДИЦИНСКОМ ОБРАЗОВАНИИ 778

Курбанов М.К., СОСТОЯНИЕ ПОКАЗАТЕЛЕЙ ЦИТОКИНОВ У ДЕТЕЙ, БОЛЬНЫХ ОСТРЫМ СРЕДНИМ ОТИТОМ, РАЗВИВШИМСЯ НА ФОНЕ САХАРНОГО ДИАБЕТА 782

Наджмитдинов О. Б., ДИАБЕТИЧЕСКАЯ ПОЛИНЕЙРОПАТИЯ У ПОСТМЕНОПАУЗАЛЬНЫХ ЖЕНЩИН: АКТУАЛЬНЫЕ КЛИНИКО-ПАТОГЕНЕТИЧЕСКИЕ АСПЕКТЫ (Обзор литературы) 787

Наджмитдинова Д. А., Абдувохидова Д. Р., КЛИНИКО-МОНИТОРИНГОВЫЙ ПОДХОД К ЛЕЧЕНИЮ ХРОНИЧЕСКОГО ТАЗОВОГО БОЛЕВОГО СИНДРОМА У ЖЕНЩИН С ГИНЕКОЛОГИЧЕСКИМИ ЗАБОЛЕВАНИЯМИ (Литературный обзор)....794

Собирова Д.Р., ОСОБЕННОСТИ ИММУНОГИСТОХИМИЧЕСКИХ ИЗМЕНЕНИЙ ЭНДОТЕЛИЯ ЛЁГОЧНЫХ СОСУДОВ В УСЛОВИЯХ ЭКСПЕРИМЕНТАЛЬНОГО САХАРНОГО ДИАБЕТА.....	798
Юсубалиев У.А., Тохтаев Г.Ш., Саипова Н.С., Сафаров Х.Х., Ашрапходжаева Н.М., КРИТИЧЕСКИЕ СОСТОЯНИЯ В КЛИНИЧЕСКОЙ ДЕРМАТОВЕНЕРОЛОГИИ: СОВРЕМЕННЫЕ ПОДХОДЫ К ДИАГНОСТИКЕ И ТЕРАПИИ	802
СОВРЕМЕННЫЕ НАУКИ И ОБРАЗОВАНИЕ	808
Bobonov D.T., Toshpulotov D.D., SUN'IY INTELLEKTNING INSON HAYOTIDAGI O'RNI.....	808
Bobonov D.T., Toshpulotov D.D., YARIMO'TKAZGICHLI MATERIALLARNING XOSSALARI, TURLARI VA ZAMONAVIY QO'LLANILISH SOHALARI	812
Bobonov D.T., Karimova I.K., LEGIRLANGAN YARIMO'TKAZGICH, MATERIALLARDAN TAYYORLANGAN ELEKTRON ASBOBLARNING HOZIRGI ZAMON TEXNIKASIDAGI O'RNI	815
Bobonov D.T., Karimova I.K., ELEKTRONIKA FANING HOZIRGI KUNDAGI DOLZARBLIGI.....	819
Sayfetdinova D. I., TALABALARDA TABIIY FANLARNI O'QITISHDA EKOLOGIK KOMPETENSIYANI RIVOJLANTIRISH METODIKASINI TAKOMILLASHTIRISH.....	823
Муртазин Э.Р., СООТНОШЕНИЕ ТЕОРИИ И ПРАКТИКИ В ОБРАЗОВАТЕЛЬНЫХ ПРОГРАММАХ ТЕХНИЧЕСКИХ СПЕЦИАЛЬНОСТЕЙ.....	829
Туйназарова И. А., ГИДРОБИОНТЫ КАК БИОИНДИКАТОРЫ АНТРОПОГЕННОГО ЗАГРЯЗНЕНИЯ РЕЧНЫХ ЭКОСИСТЕМ: СОВРЕМЕННЫЕ ПОДХОДЫ И ПЕРСПЕКТИВЫ ПРИМЕНЕНИЯ.....	833
Холматов Б.Т., АГРОЭКОЛОГИЧЕСКАЯ РОЛЬ МАСЛИЧНЫХ КУЛЬТУР В СЕВООБОРОТЕ И ИХ ВЛИЯНИЕ НА ЭКОЛОГИЧЕСКОЕ СОСТОЯНИЕ ПОЧВ.....	837

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