# HYGIENE EDUCATION IN DISEASE PREVENTION FOR CHILDREN, ADOLESCENTS, AND YOUNG ADULTS

Khorosheva IV[1], Devrishov RD[1] ✉, Kudryasheva IA[1], Markelova SV[2], Reshetnikova IO[2], Skoblina NA[2]

[1] Astrakhan State Medical University, Astrakhan, Russia

[2] Pirogov Russian National Research Medical University (Pirogov University), Moscow, Russia

In the future, the state of health of children, adolescents, and young adults will require continuous attention from healthcare professionals. The stably high prevalence of the school-related diseases associated with the learning conditions and lifestyle components requires introduction of new approaches into prevention of health problems in the younger generation. The study aimed to summarize the results of the research focused on the features of lifestyle of children, adolescents, and young adults, as well as on the approaches to their hygiene education. The review of scientific papers deposited in the eLibrary, PubMed, CyberLeninka databases in 2010–2024 was accomplished. The literature data analysis showed the need to refocus attention on the methods for primary prevention of health problems in the youth, not on the secondary prevention methods. One effective mechanism of such work is the hygiene education system, which in this case should be directed towards individuals engaged in the youth training and education system, healthare professionals, and parents.

**Keywords:** children, adolescents, youth, school-related diseases, hygiene education, disease prevention

**Author contribution:** Khorosheva IV, Devrishov RD — data acquisition, manuscript draft writing; Kudryasheva IA — structuring and finalizing the manuscript; Markelova SV, Skoblina NA — shaping the paper concept, structuring and finalizing the manuscript; Reshetnikova IO — data acquisition.

**Compliance with ethical standards:** the study was approved by the Ethics Committee of the Astrakhan State Medical University (protocol No. 7 dated 10 July 2023).

✉ **Correspondence should be addressed:** Ruslan D. Devrishov
Bakinskaya, 121, Astrakhan, 414000, Russia; memorydb@yandex.ru

**Received:** 09.01.2025 **Accepted:** 29.08.2026 **Published online:** 28.09.2025

**DOI:** 10.24075/rbh.2025.140

# ГИГИЕНИЧЕСКОЕ ВОСПИТАНИЕ В ПРОФИЛАКТИКЕ ЗАБОЛЕВАНИЙ ДЕТЕЙ, ПОДРОСТКОВ И МОЛОДЕЖИ

И. В. Хорошева[1], Р. Д. Девришов[1] ✉, И. А. Кудряшева[1], С. В. Маркелова[2], И. О. Решетникова[2], Н. А. Скоблина[2]

[1] Астраханский государственный медицинский университет, Астрахань, Россия

[2] Российский национальный исследовательский медицинский университет имени Н. И. Пирогова (Пироговский Университет), Москва, Россия

В будущем состояние здоровья детей, подростков и молодежи потребует постоянного внимания медицинских работников. Стабильно высокая распространенность школьно-обусловленных болезней, связанных с условиями обучения и компонентами образа жизни, требует введения новых подходов в профилактику нарушений здоровья подрастающего поколения. Целью настоящей работы было обобщить результаты научных исследований особенностей образа жизни детей, подростков и молодежи и подходов к их гигиеническому воспитанию. Выполнен обзор научных статей, размещенных в библиографических базах данных eLibrary, PubMed, КиберЛенинка в период с 2010 по 2024 г. Анализ литературных данных продемонстрировал необходимость перенести фокус внимания с методов вторичной профилактики на методы первичной профилактики нарушения здоровья молодого поколения. Одним из действенных механизмов такой работы является система гигиенического воспитания, которая должна быть в данном случае ориентирована на лиц, причастных к системе воспитания и образования молодого поколения, медицинских работников и родителей.

**Ключевые слова:** дети, подростки, молодежь, школьно-обусловленные заболевания, гигиеническое воспитание, профилактика заболеваний

**Вклад авторов:** И. В. Хорошева, Р. Д. Девришов — сбор данных, подготовка первоначального варианта рукописи; И. А. Кудряшева — структурирование и доработка рукописи; С. В. Маркелова, Н. А. Скоблина — формирование концепции статьи, структурирование и доработка рукописи; И. О. Решетникова — сбор данных.

**Соблюдение этических стандартов:** исследование было одобрено этическим комитетом ФГБОУ ВО Астраханский ГМУ Минздрава России (протокол № 7 от 10 июля 2023 г.).

✉ **Для корреспонденции:** Руслан Девришович Девришов
ул. Бакинская, д. 121, г. Астрахань, 414000, Россия; memorydb@yandex.ru

**Статья получена:** 09.01.2025 **Статья принята к печати:** 29.08.2026 **Опубликована онлайн:** 28.09.2025

**DOI:** 10.24075/rbh.2025.140

Negative trends of social and economic processes in the first quarter of the 21st century were manifested by noticeable changes in the quality of life of the population, including the quality of life of the younger generation. The incidence of all disease categories grows; the demographic situation worsens [1–3].

The term “school-related diseases” is still relevant. The rate of those remains stable. These diseases include musculoskeletal disorders, diseases of the eye and adnexa, gastrointestinal disorders, diseases affecting the cardiovascular and nervous systems [4–7]. Secondary prevention of such disorders demonstrates its inconsistency over a long time.

The study aimed to summarize the results of the research focused on the features of lifestyle of children, adolescents, and young adults, as well as on the approaches to their hygiene education.

The review of scientific papers deposited in the eLibrary, PubMed, CyberLeninka databases in 2010–2024 was accomplished.

The results of multiple studies suggest that there are a number of risk factors for the health problems associated with the conditions of the children’s and adolescents’ stay in the educational institution. The control of their effects on the students’ bodies is accomplished in accordance with the current regulatory and procedural documents. Among most important factors that can affect the health of the younger generation since preshool age, parameters of microclimate and lighting in the educational institution, fullness of the group or class, compliance of furniture

with anthropometric measures, curriculum, and adherence to the daily routine are reported [8–12].

The prevalence of school-related diseases among children and adolscents in the last seven years demonstrate a trend towards slight growth in the groups of both 7–11-year-old and 16–17-year-old students. The diseases typical for this group include diseases of the eye and adnexa, nervous system disorders, gastrointestinal and carviovascular disorders. A slight decrease in the disease prevalence in this period has been reported for musculoskeletal disorders [4].

The increase in the rate of school-related diseases in the group of 7–11-year-old children can be considered as an unfavorable prognostic marker indirectly showing the increase in the prevalence of this disease type among preschool children.

Currently, the use of digital technology in the educational system is a promising area contributing to faster information acquisition, enabling shaping a personalized learning trajectory, making the educational system more accessible (time, terms, and site) and clear [13].

Researchers from different countries agree that the society digitalization processes are reflected in the organization of educational and leisure activities for children and adolescents, as well as in the construction of educational programs. The electronic devices used and the conditions under which they are used must be safe, which is possible with strict adherence to sanitary and hygienic standards [15–17].

Scientists report a decrease in the age of children, who use various electronic devices regularly. The study [18] has shown that every second child (53.7%) starts using an electronic device under the age of two, every fifth (21.9%) at the age of 2–3 years, every thirtheenth (7,6%) at the age of 3–4 years; only every sixth (16.8%) child starts using an electronic device over the age of four. Furthermore, according to the data provided by the authors, the number of children who received access to an electronic device under the age of four doubled over the two years of the study.

Today, the number of scientific papers on the pattern of the impact of electronic devices on preschool children is limited; the risk of health problems in children is poorly understood [19–21].

During the study [22] it was found that high-school students spend 3.0 h a day using smartphones for learning and leisure, while senior students spend as much as 5.3 h on this. In university students, the time spent on the smartphone exceeds 6.9 h a day.

The papers by other authors report that more that 90% of adolescents use electronic devices for more than two hours a day [23].

Among the longest (more than three hours a day) leisure activities, watching TV and videos is reported for the majority (74%) of adolescents aged 15–17 [24]. Furthermore, it has been found that the long-term watching of video content and visiting social networks contribute to disruption of the sleep quality and structure: the process of falling asleep is disrupted, the duration of sleep is reduced, and anxiety and depressive conditions occur [22, 25].

The long-term static tension is an integral part of the educational process; it is also caused by the use of electronic devices. Such activities are accompanied by maintaining a forced working posture, which creates prerequisites for the development of musculoskeletal disorders.

The literature sources provide information on the factors of the intra-school environment, also associated with the increase in static load and predetermining scoliosis in students. Such factors include the reduced duration of breaks, reduced frequency of physical education classes. A negative role of deficit of certain foods in the students' diet, in particular wheat and rye bread, potatoes, fresh vegetables, milk and dairy products, fish, is noted [26].

Scoliosis is one of the most common musculoskeletal system disorders in children and adolescents. A school backpack that is too heavy for the child, uneven length and width of the straps, being engaged in elite sports, insufficient physical activity, and a number of other factors are distinguished among the factors interrelated with lifestyle and contributing to scoliosis.

The analysis of the musculoskeletal system functional state in elementary school students of the gymnasium and lyceum in Maykop revealed various postural disorders in a half of the assessed children. In particular, 27.3% of school students had a slouching posture and 14.1% had a winged scapula [27].

Other researchers report that among elementary school children (6–10 years) postural disorders are reported in every second child (48.2%). The most common disorder is a scoliotic posture reported in 43.4% of cases. As children get older, the prevalence of scoliotic posture among them increases. Thus, the prevalence of this disorder in 10-year-old children reaches 65.1% [28].

One educational space factor affecting the development of musculoskeletal disorders is the students' furniture. Regulatory and methodological documents stipulate the need for the size of school furniture to correspond to the student's body length. At the same time, the scientists' papers provide information that every second set (45.3%) of school furniture does not correspond to the student's body length. This is due to incorrect furnishing of school classrooms, equipping classrooms with furniture of the same size [29].

Thus, one more study has shown that the vast majority of student places for first-year (86.7%) and fourth-year (62.4%) students do not correspond to the students' body length [30].

Among the detected musculoskeletal system disorders, foot arch malformations are one of the most common. Thus, among children aged 7–10 years who attend sports sections, the overwhelming majority (more than 90%) have a diagnosis of flat feet of varying severity. Some of them (10%) also have postural disorders of scoliotic type [31].

According to the data from another source, flat feet are reported in every fifth first-year (22.6%) and third-year (23.8%) school student [32].

The prevalence of flat foot in university students is 44.5%. A half of these students (24.3%) also have a postural disorder [33].

The data from foreign sources suggest high prevalence (65%) of flat feet in children aged 6–8 living in Slovakia [34].

The study conducted by other researchers has shown that scoliotic alterations (OR = 4.9), flat foot (OR = 17.4), and hallux valgus (OR = 10.6) in children are associated with insufficient physical activity [35].

The paper [36] reports the increased prevalence of visual impairment among students of various levels of education, which is due to the use of electronic devices (smartphone, computer, TV). The 8.6-fold increased likelihood of developing myopia is reported for those, who use a laptop (computer) for more that four hours a day.

## CONCLUSION

The available literature data suggest an adverse effect of the irrationally organized lifestyle components, learning conditions of the health of children, adolescents, and young adults. Prevention of musculoskeletal, eye, nervous system disorders and sleep-awake cycle disturbances is still relevant. The risk factors

of health problems in children, adolescents, and young adults attending educational institutions persist, so it is necessary to develop more effective preventive measures of both personalized and group type. The list of such measures should be expanded to include hygiene education programs for individuals involved in educational processes. Continuity is a particularly significant aspect of developing a healthy lifestyle and preventing diseases in students. This means that knowledge and lifestyle of children and adolescents largely depend on the awareness and formation of healthy lifestyle skills in their family members, teaching staff and healthcare professionals in educational institutions. In the hygiene education programs, it is important to use various information presentation methods taking into account the interests of children and adolescents, as well as of their inner circle.

Thus, the scientific data acquired on the risk factors of health problems in the younger generation, including those associated with the educational process at the preschool, general and vocational education organizations, must provide a reliable scientific and methodological basis for the development of preventive measures aimed at preserving the health of the younger generation.

**References**


1. Akishin SV, Dementev AA. Ocenka riska dlja zdorov'ja faktorov obraza zhizni obuchajushhejsja molodezhi. Vestnik novyh medicinskih tehnologij. Jelektronnoe izdanie. 2020; (1): 77–84 (in Rus.). DOI: 10.24411/2075-4094-2020-16535.
2. Aminova OS. Lifestyle-associated risk factors affecting young people. Russian Bulletin of Hygiene. 2023; (2): 15–20. DOI: 10.24075/rbh.2023.069.
3. Horosheva IV, Devrishov RD, Skoblina NA, Zhukov OF. Gigienicheskaja ocenka vlijanija faktorov sredy obitanija na formirovanie zabolevanij kostno-myshechnoj sistemy u pervoklassnikov. Vestnik novyh medicinskih tehnologij. Jelektronnoe izdanie. 2024; 18 (3): 70–3 (in Rus.). DOI: 10.24412/2075-4094-2024-3-2-5.
4. Elkina TN, Lihanova MG, Pirozhkova NI, Surovikina EA, Tatarenko JuA. Sostojanie zdorov'ja shkol'nikov g. Novosibirska po dannym profilakticheskih osmotrov v dinamike. Mat' i ditja v Kuzbasse. 2024; 3 (98): 72–8 (in Rus.).
5. Setko NP, Zhdanova OM, Setko AG. Psychophysiological features of students at different risk of internet-addictive behavior. Russian Bulletin of Hygiene. 2024; (1): 34–41. DOI: 10.24075/rbh.2024.091.
6. Popov VI, Milushkina OJu, Skoblina NA, Markelova SV, Sokolova NV, Dementev AA. Povedencheskie riski zdorov'ju studentov v period provedenija distancionnogo obuchenija. Gigiena i sanitarija. 2020; 99 (8): 854–60 (in Rus.). DOI: 10.47470/0016-9900-2020-99-8-854-860.
7. Popov VI. Gigienicheskaja harakteristika podhodov, harakterizujushhih vozrastnye osobennosti detej, podrostkov i molodezhi. Zdravoohranenie Rossijskoj Federacii. 2019; 63 (4): 199–204 (in Rus.). DOI: 10.18821/0044-197X-2019-63-4-199-204.
8. Valina SL, Zajceva NV, Shtina IE, Ustinova OJu, Jejsfeld DA. Gigienicheskaja ocenka vlijanija faktorov obrazovatel'nogo processa i obraza zhizni na sostojanie zdorov'ja uchashhihsja profil'nyh shkol v uslovijah promyshlennogo megapolisa. Gigiena i sanitarija. 2020; 99 (8): 822–8 (in Rus.). DOI: 10.47470/0016-9900-2020-99-8-822-828.
9. Kuchma VR, Tkachuk EA, Shisharina NV, Podlinjaev OL. Gigienicheskaja ocenka innovacionnyh obrazovatel'nyh tehnologij v nachal'noj shkole. Gigiena i sanitarija. 2019; 98 (3): 288–93 (in Rus.). DOI: 10.18821/0016-9900-2019-98-3-288-293.
10. Devrishov RD. Review of factors determining living conditions of modern scoolchildren. Russian Bulletin of Hygiene. 2022; (3): 27–32 (in Rus.). DOI: 10.24075/rbh.2022.054.
11. Setko AG, Bulycheva EV, Setko NP. Gigienicheskaja harakteristika naprjazhennosti uchebnogo processa i fiziologicheskih reakcij organizma studentov s razlichnym urovnem rabotosposobnosti. Zdorov'e naselenija i sreda obitanija — ZNiSO. 2019; (11): 56–60 (in Rus.). DOI: 103567/2219-5238/2019-320-11-56-60.
12. Derikx DFAA, Houwen S, Meijers V, Shoemaker MM, Hartman E. The relationship between social environmental factors and motor performance in 3 to 12 year old typically developing children: a systematic review. Int J Environ Res Public Health. 2021; 18 (14): 7516. DOI: 10.3390/ijerph18147516.
13. Kuchma VR, Polenova MA, Stepanova MI. Informatizacija obrazovanija: mediko-social'nye problemy, tehnologii obespechenija gigienicheskoj bezopasnosti obuchajushhihsja. Gigiena i sanitarija. 2021; 100 (9): 903–9 (in Rus.). DOI: 10.47470/0016-9900-2021-100-9-903-909.
14. Aleksandrova IJe. Gigienicheskaja optimizacija uchebnogo processa v shkole v uslovijah ispol'zovanija jelektronnyh sredstv obuchenija. Analiz riska zdorov'ju. 2020; (2): 47–54 (in Rus.). DOI: 10.21668/health.risk/2020.2.05.
15. Popov VI, Milushkina OJu, Skoblina NA, Tarasov AV, Markelova SV, Lovkis AA, et al. Vlijanie ispol'zovanija social'nyh setej na formirovanie internet-zavisimostej u studentov-medikov. Zdorov'e naselenija i sreda obitanija — ZNiSO. 2022; (8): 51–6 (in Rus.). DOI: 10.35627/2219-5238/2022-30-8-51-56.
16. Tong WX, Li B, Han SS, Han YH, Meng SQ, Guo Q, et al. Current status and correlation of physical activity and tendency to problematic mobile phone use in college students. Int J Environ Res Public Health. 2022; 19 (23): 15849. DOI: 10.3390/ijerph192315849.
17. Alimoradi Z, Lin CY, Brostrom A, Bulow PH, Bajalan Z, Griffiths MD, et al. Internet addiction and sleep problems: a systematic review and meta-analysis. Sleep Med Rev. 2019; (47): 51–61. DOI: 10.1016/j.smrv.2019.06.004.
18. Nikolaeva EI, Isachenkova ML. Osobennosti ispol'zovanija gadzhetov det'mi do chetyreh let po dannym ih roditelej. Kompleksnye issledovanija detstva. 2022; 4 (1): 32–53 (in Rus.). DOI: 10.33910/2687-0223-2022-4-1-32-53.
19. Nikolaeva EI. Rebenok kak jekspert. V knige: Rjabova TB, Rjabov OV, redaktory. Simvol detstva v politike: ot holodnoj vojny k sovremennosti: tezisy nauchnoj konferencii. SPb.: Izd-vo RGPU im. A.I. Gercena, 2019; 18–21 (in Rus.).
20. Kirkorian HL, Choi K, Yoo SH, Etta RA. The impact of touchscreen interactivity on U.S. toddlers' selective attention and learning from digital media. J Child Media. 2021; 16 (2): 188–204. DOI: 10.1080/17482798.2021.1944888.
21. Yadav S, Chakraborty P, Mittal P. Designing drawing apps for children: artistic and technological factors. Int J Hum-Comput Int. 2021; 38 (2): 103–17. DOI: 10.1080/10447318.2021.1926113.
22. Ushakov IB, Popov VI, Skoblina NA, Markelova SV. Dlitel'nost' ispol'zovanija mobil'nyh jelektronnyh ustrojstv kak sovremennyj faktor riska zdorov'ju detej, podrostkov i molodezhi. Jekologija cheloveka. 2021; (7): 43–50 (in Rus.). DOI: 10.33396/1728-0869-2021-7-43-50.
23. Bronskih NA, Sharenko EM, Popova OS, Nasybulina GM. Hygienic description of lifestyle factors among students of colleges. Russian Bulletin of Hygiene. 2022; (4): 19–25. DOI: 10.24075/rbh.2022.057.
24. Eliseev JuJu, Eliseeva JuV. Sostojanie zdorov'ja i kachestvo zhizni detej i podrostkov Saratovskoj oblasti: monitoring i upravlenie. Vestnik medicinskogo instituta "Reaviz": reabilitacija, vrach i zdorov'e. 2017; 3 (27): 87–91 (in Rus.).
25. Carpenter C, Byun SE, Turner-McGrievy G, West D. An exploration of domain specific sedentary behaviors in college students by lifestyle factors and sociodemographics. Int J Environ Res Public Health. 2021; 18 (18): 9930. DOI: 10.3390/ijerph18189930.
26. Valina SL, Shtina IE, Maklakova OA, Ustinova OJu, Jejsfeld DA. Zakonomernosti razvitija u shkol'nikov boleznej kostno-myshechnoj sistemy v uslovijah kompleksnogo vozdejstvija faktorov sredy obitanija i obraza zhizni. Analiz riska zdorov'ju. 2021; (3): 54–66 (in Rus.). DOI: 10.21668/health.risk/2021.3.05.
27. Kolomijceva NS, Doronin AM, Zhukov VI, Kagazezheva NH, Doronina NV. Ispol'zovanie fizicheskih uprazhnenij dlja profilaktiki

narushenij oporno-dvigatel'nogo apparata u detej shkol'nogo vozrasta. Fizicheskaja kul'tura i sport — nauka i praktika. 2019; (4): 12–7 (in Rus.).
28. Korjagina JuV, Abutalimova SM, Roguleva LG, Nopin SV, Kopanev AN. Funkcional'noe sostojanie oporno-dvigatel'nogo apparata detej 6–10 let, ne zanimajushhihsja sportom. Sovremennye voprosy biomediciny. 2019; 4 (9): 75–88 (in Rus.).
29. Poljakova AN, Selezneva EV, Denisova NB, Pozdnjakova TV. Sredovye faktory obrazovatel'nogo uchrezhdenija i sostojanie zdorov'ja uchashhihsja. Vestnik novyh medicinskih tehnologij. Jelektronnoe izdanie. 2013; (1): 242 (in Rus.).
30. Zulkarnaeva AT, Povargo EA, Zulkarnaev TR, Ovsjannikova LB, Agafonov AI. Vlijanie otdel'nyh faktorov na sostojanie zdorov'ja shkol'nikov. Zdorov'e naselenija i sreda obitanija — ZNiSO. 2012; (8): 29–31 (in Rus.).
31. Aleksandrova VA, Ovchinnikov VI, Skotnikova AV. Metodika ocenki sostojanija oporno-dvigatel'nogo apparata u detej mladshego shkol'nogo vozrasta. Izvestija TulGU. Fizicheskaja kul'tura. Sport. 2022; (12): 3–10 (in Rus.). DOI: 10.24412/2305-8404-2022-12-3-10.
32. Hramcov PI, Sedova AS, Berezina NO. Izmenenie sostojanija stop u mladshih shkol'nikov v processe obuchenija v rezhime dinamicheskih poz. Zdorov'e naselenija i sreda obitanija — ZNiSO. 2020; 8 (329): 38–42 (in Rus.). DOI: 10.35627/2219-5238/2020-329-8-38-42.
33. Kabysheva MI, Glazina TA. Funkcional'nye narushenija oporno-dvigatel'nogo apparata studentov (na primere Orenburgskogo gosudarstvennogo universiteta). Vestnik OGU. 2017; 2 (202): 129–34 (in Rus.).
34. Kolarova M, Kutis P, Rusnak R, Hrckova Z, Hudakova Z, Lysa L, et al. Analysis of body segments and postural state in school children. Neuro Endocrinol Lett. 2019; 40 (1): 17–23.
35. Efimova NV, Mylnikova IV. Ocenka riska dlja zdorov'ja podrostkov v zavisimosti ot faktorov okruzhajushhej sredy i obraza zhizni. Kazanskij medicinskij zhurnal. 2016; 97 (5): 771–7 (in Rus.). DOI: https://doi.org/10.17750/KMJ2016-771.
36. Rjazanova EA, Lir DN, Zagidullina DSh. Jelektronnye cifrovye ustrojstva i risk narushenija funkcij zritel'nogo analizatora obuchajushhihsja raznyh urovnej obrazovanija. Analiz riska zdorov'ju. 2023; (3): 85–92 (in Rus.). DOI: 10.21668/health.risk/2023.3.08.

**Литература**

1. Акишин С. В., Дементьев А. А. Оценка риска для здоровья факторов образа жизни обучающейся молодежи. Вестник новых медицинских технологий. Электронное издание. 2020; (1): 77–84. DOI: 10.24411/2075-4094-2020-16535.
2. Аминова О. С. Факторы риска для здоровья, связанные с образом жизни молодежи. Российский вестник гигиены. 2023; (2): 15–21. DOI: 10.24075/rbh.2023.069.
3. Хорошева И. В., Девришов Р. Д., Скоблина Н. А., Жуков О. Ф. Гигиеническая оценка влияния факторов среды обитания на формирование заболеваний костно-мышечной системы у первоклассников. Вестник новых медицинских технологий. Электронное издание. 2024; 18 (3): 70–3. DOI: 10.24412/2075-4094-2024-3-2-5.
4. Елкина Т. Н., Лиханова М. Г., Пирожкова Н. И., Суровикина Е. А., Татаренко Ю. А. Состояние здоровья школьников г. Новосибирска по данным профилактических осмотров в динамике. Мать и дитя в Кузбассе. 2024; 3 (98): 72–8.
5. Сетко Н. П., Жданова О. М., Сетко А. Г. Психофизиологические особенности студентов с разным уровнем риска интернет-зависимого поведения. Российский вестник гигиены. 2024; (1): 37–45. DOI: 10.24075/rbh.2024.091.
6. Попов В. И., Милушкина О. Ю., Скоблина Н. А., Маркелова С. В., Соколова Н. В., Дементьев А. А. Поведенческие риски здоровью студентов в период проведения дистанционного обучения. Гигиена и санитария. 2020; 99 (8): 854–60. DOI: 10.47470/0016-9900-2020-99-8-854-860.
7. Попов В. И. Гигиеническая характеристика подходов, характеризующих возрастные особенности детей, подростков и молодежи. Здравоохранение Российской Федерации. 2019; 63 (4): 199–204. DOI: 10.18821/0044-197X-2019-63-4-199-204.
8. Валина С. Л., Зайцева Н. В., Штина И. Е., Устинова О. Ю., Эйсфельд Д. А. Гигиеническая оценка влияния факторов образовательного процесса и образа жизни на состояние здоровья учащихся профильных школ в условиях промышленного мегаполиса. Гигиена и санитария. 2020; 99 (8): 822–8. DOI: 10.47470/0016-9900-2020-99-8-822-828.
9. Кучма В. Р., Ткачук Е. А., Шишарина Н. В., Подлиняев О. Л. Гигиеническая оценка инновационных образовательных технологий в начальной школе. Гигиена и санитария. 2019; 98 (3): 288–93. DOI: 10.18821/0016-9900-2019-98-3-288-293.
10. Девришов Р. Д. Обзор факторов, определяющих условия жизнедеятельности современных обучающихся. Российский вестник гигиены. 2022; (3): 29–34. DOI: 10.24075/rbh.2022.054.
11. Сетко А. Г., Булычева Е. В., Сетко Н. П. Гигиеническая характеристика напряженности учебного процесса и физиологических реакций организма студентов с различным уровнем работоспособности. Здоровье населения и среда обитания — ЗНиСО. 2019; (11): 56–60. DOI: 103567/2219-5238/2019-320-11-56-60.
12. Derikx DFAA, Houwen S, Meijers V, Shoemaker MM, Hartman E. The relationship between social environmental factors and motor performance in 3 to 12 year old typically developing children: a systematic review. Int J Environ Res Public Health. 2021; 18 (14): 7516. DOI: 10.3390/ijerph18147516.
13. Кучма В. Р., Поленова М. А., Степанова М. И. Информатизация образования: медико-социальные проблемы, технологии обеспечения гигиенической безопасности обучающихся. Гигиена и санитария. 2021; 100 (9): 903–9. DOI: 10.47470/0016-9900-2021-100-9-903-909.
14. Александрова И. Э. Гигиеническая оптимизация учебного процесса в школе в условиях использования электронных средств обучения. Анализ риска здоровью. 2020; (2): 47–54. DOI: 10.21668/health.risk/2020.2.05.
15. Попов В. И., Милушкина О. Ю., Скоблина Н. А., Тарасов А. В., Маркелова С. В., Ловкис А. А. и др. Влияние использования социальных сетей на формирование интернет-зависимостей у студентов-медиков. Здоровье населения и среда обитания — ЗНиСО. 2022; (8): 51–6. DOI: 10.35627/2219-5238/2022-30-8-51-56.
16. Tong WX, Li B, Han SS, Han YH, Meng SQ, Guo Q, et al. Current status and correlation of physical activity and tendency to problematic mobile phone use in college students. Int J Environ Res Public Health. 2022; 19 (23): 15849. DOI: 10.3390/ijerph192315849.
17. Alimoradi Z, Lin CY, Brostrom A, Bulow PH, Bajalan Z, Griffiths MD, et al. Internet addiction and sleep problems: a systematic review and meta-analysis. Sleep Med Rev. 2019; (47): 51–61. DOI: 10.1016/j.smrv.2019.06.004.
18. Николаева Е. И., Исаченкова М. Л. Особенности использования гаджетов детьми до четырех лет по данным их родителей. Комплексные исследования детства. 2022; 4 (1): 32–53. DOI: 10.33910/2687-0223-2022-4-1-32-53.
19. Николаева Е. И. Ребенок как эксперт. В книге: Рябова Т. Б., Рябов О. В., редакторы. Символ детства в политике: от холодной войны к современности: тезисы научной конференции. СПб.: Изд-во РГПУ им. А. И. Герцена, 2019; 18–21.
20. Kirkorian HL, Choi K, Yoo SH, Etta RA. The impact of touchscreen interactivity on U.S. toddlers' selective attention and learning from digital media. J Child Media. 2021; 16 (2): 188–204. DOI: 10.1080/17482798.2021.1944888.
21. Yadav S, Chakraborty P, Mittal P. Designing drawing apps for children: artistic and technological factors. Int J Hum-Comput Int. 2021; 38 (2): 103–17. DOI: 10.1080/10447318.2021.1926113.
22. Ушаков И. Б., Попов В. И., Скоблина Н. А., Маркелова С. В. Длительность использования мобильных электронных устройств как современный фактор риска здоровью детей, подростков и молодежи. Экология человека. 2021; (7): 43–50. DOI: 10.33396/1728-0869-2021-7-43-50.
23. Бронских Н. А., Шаренко Е. М., Попова О. С. Насыбулина Г. М. Гигиеническая характеристика факторов образа жизни

учащихся колледжей. Российский вестник гигиены. 2022; (4): 19–25. DOI: 10.24075/rbh.2022.057.
24. Елисеев Ю. Ю., Елисеева Ю. В. Состояние здоровья и качество жизни детей и подростков Саратовской области: мониторинг и управление. Вестник медицинского института «Реавиз»: реабилитация, врач и здоровье. 2017; 3 (27): 87–91.
25. Carpenter C, Byun SE, Turner-McGrievy G, West D. An exploration of domain specific sedentary behaviors in college students by lifestyle factors and sociodemographics. Int J Environ Res Public Health. 2021; 18 (18): 9930. DOI: 10.3390/ijerph18189930.
26. Валина С. Л., Штина И. Е., Маклакова О. А., Устинова О. Ю., Эйсфельд Д. А. Закономерности развития у школьников болезней костно-мышечной системы в условиях комплексного воздействия факторов среды обитания и образа жизни. Анализ риска здоровью. 2021; (3): 54–66. DOI: 10.21668/health.risk/2021.3.05.
27. Коломийцева Н. С., Доронин А. М., Жуков В. И., Кагазежева Н. Х., Доронина Н. В. Использование физических упражнений для профилактики нарушений опорно-двигательного аппарата у детей школьного возраста. Физическая культура и спорт — наука и практика. 2019; (4): 12–7.
28. Корягина Ю. В., Абуталимова С. М., Рогулева Л. Г., Нопин С. В., Копанев А. Н. Функциональное состояние опорно-двигательного аппарата детей 6–10 лет, не занимающихся спортом. Современные вопросы биомедицины. 2019; 4 (9): 75–88.
29. Полякова А. Н., Селезнева Е. В., Денисова Н. Б., Позднякова Т. В. Средовые факторы образовательного учреждения и состояние здоровья учащихся. Вестник новых медицинских технологий. Электронное издание. 2013; (1): 242.
30. Зулькарнаева А. Т., Поварго Е. А., Зулькарнаев Т. Р., Овсянникова Л. Б., Агафонов А. И. Влияние отдельных факторов на состояние здоровья школьников. Здоровье населения и среда обитания — ЗНиСО. 2012; (8): 29–31.
31. Александрова В. А., Овчинников В. И., Скотникова А. В. Методика оценки состояния опорно-двигательного аппарата у детей младшего школьного возраста. Известия ТулГУ. Физическая культура. Спорт. 2022; (12): 3–10. DOI: 10.24412/2305-8404-2022-12-3-10.
32. Храмцов П. И., Седова А. С., Березина Н. О. Изменение состояния стоп у младших школьников в процессе обучения в режиме динамических поз. Здоровье населения и среда обитания — ЗНиСО. 2020; 8 (329): 38–42. DOI: 10.35627/2219-5238/2020-329-8-38-42.
33. Кабышева М. И., Глазина Т. А. Функциональные нарушения опорно-двигательного аппарата студентов (на примере Оренбургского государственного университета). Вестник ОГУ. 2017; 2 (202): 129–34.
34. Kolarova M, Kutis P, Rusnak R, Hrckova Z, Hudakova Z, Lysa L, et al. Analysis of body segments and postural state in school children. Neuro Endocrinol Lett. 2019; 40 (1): 17–23.
35. Ефимова Н. В., Мыльникова И. В. Оценка риска для здоровья подростков в зависимости от факторов окружающей среды и образа жизни. Казанский медицинский журнал. 2016; 97 (5): 771–7. DOI: https://doi.org/10.17750/KMJ2016-771.
36. Рязанова Е. А., Лир Д. Н., Загидуллина Д. Ш. Электронные цифровые устройства и риск нарушения функций зрительного анализатора обучающихся разных уровней образования. Анализ риска здоровью. 2023; (3): 85–92. DOI: 10.21668/health.risk/2023.3.08.