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Sociological analysis of medical and preventive care needs among students of a Russian multidisciplinary university

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Abstract

Aim: to identify students' needs for medical and preventive care, identify barriers to access to medical services, and assess readiness to implement the integrated University of Health model using the example of the RUDN University.

Material and methods. A sociological survey was conducted by interviewing 682 students (489 Russian, 193 foreigners) aged 17-35 years, divided into different courses, faculties and areas of study. An author's questionnaire of 60 questions was used with the inclusion of a validated EQ-5D-5L questionnaire to assess the quality of life.

Results. The majority of students (73.2%) rated their health as good and excellent. However, a significant number of students noted difficulties with mental and emotional health. Anxiety states were noted in 44.7% of students, the average value on the EQ-5D-5L health scale was 70.8±15.2 points out of 100. Limited physical activity is observed in 39.3% of students, insufficient sleep is typical for 49.8% of respondents. 89.4% of students are aware of the presence of the university Clinical Diagnostic Center, while only 52.8% applied there. The main barriers to access are organizational (long waiting 20.1%, inconvenient time 15.0%). 69.6% of students are positive about the idea of the integrated "University of Health" model and 67.7% are ready to actively use the services offered.

Conclusion. The study confirms the need to develop an integrated model of medical and preventive care. The high readiness of students for the concept of the "University of Health" creates conditions for the successful implementation of this model in the practice of a multidisciplinary university.

Keywords: medical and preventive care, accessibility of medical care, academic medical cluster, University of health.

Conflict of interest: nothing to disclose.

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Социологический анализ потребностей студентов российского многопрофильного университета в медико-профилактической помощи

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Аннотация

Цель: выявить потребности студентов в медико-профилактической помощи, определить барьеры доступа к медицинским услугам и оценить готовность к внедрению интегрированной модели «Университет здоровья» на примере РУДН им. Патриса Лумумбы.

Материал и методы. Проведено социологическое исследование методом анкетирования 682 студентов (489 российских, 193 иностранных) в возрасте 17–35 лет, распределенных по разным курсам, факультетам и направлениям подготовки. Использована авторская анкета из 60 вопросов с включением валидированного опросника EQ-5D-5L для оценки качества жизни.

Результаты. Большинство студентов (73,2%) оценили свое здоровье как хорошее и отличное. Однако значительное число обучающихся отметили сложности с психоэмоциональным здоровьем. Тревожные состояния отмечены у 44,7% студентов, среднее значение по шкале здоровья EQ-5D-5L составило 70,8±15,2 балла из 100. Ограниченная физическая активность наблюдается у 39,3% студентов, недостаточный сон характерен для 49,8% опрошенных. 89,4% студентов осведомлены о наличии Клинико-диагностического центра университета, однако обращались туда только 52,8%. Основными барьерами доступа являются организационные (длительное ожидание 20,1%, неудобное время 15,0%). 69,6% студентов положительно относятся к идее интегрированной модели «Университет здоровья» и 67,7% готовы активно использовать предлагаемые услуги.

Заключение. Исследование подтверждает необходимость развития интегрированной модели медико-профилактической помощи. Высокая готовность студентов к концепции «Университет здоровья» создает условия для успешной реализации этой модели в практике многопрофильного университета.

Ключевые слова: медико-профилактическая помощь, доступность медицинской помощи, академический медицинский кластер, университет здоровья.

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INTRODUCTION

Students are a special social group experiencing a critical period of formation of fundamental habits and stereotypes that shale their health for their entire life. Entering a university comes with a marked stress of the adaptive potential of the organism and exposes it to many risk factors that often surpass the adaptive capacity [1–3]. Preservation of students' health is one of priority tasks of the education and the healthcare systems of the Russian Federation.

Scientific research performed in Russian higher education institutions shows that over 50% of students have health disorders. Studies of the Research Institute of Hygiene and Health Protection of Children and Adolescents show that in the past two decades prevalence of functional disorders among young people has increased significantly. Intensive academic activity, psycho-emotional stress, unhealthy living, lack of physical activity, sleeping and food pattern disorders contribute to development of various diseases and functional disorders [4–6].

The problem of psycho-emotional condition of students is especially urgent. According to the research performed in 2024 by the scientists of Moscow City Pedagogical University, the most common psychological problem of students is high anxiety identified in 46% respondents, while 32% of the students experience difficulties in the identification of live goals and require psychological support [7].

Modern healthcare research confirms a direct correlation between the health of the students and their academic performance. Thus, unfavorable physical condition may significantly reduce academic efficiency precluding achievement of educational goals and might result in academic expulsion. Support of students' health becomes not just a medical but rather pedagogical task of utmost importance [8, 9].

At the same time, the present-day system of medical assistance to students in the Russian universities is often fragmented and insufficiently integrated. Primary healthcare, prevention activities, sanatorium and resort treatment and rehabilitation often function as separate weakly connected components. This results in an inefficient use of resources and precludes full satisfaction of students' needs in a comprehensive medical and preventive care [10, 11].

Considering the above, more and more attention is paid to the development of the Health Promoting University concept recommended by the WHO. It comprises a comprehensive integrated approach towards improvement of health of all members of the university community including students and faculty by bringing together the effort of the medical services, academic units, administration and social services. The integrated model provides a coordinated provision of medical care, prevention care, healthy living promotion programs and psychological support in the unified organizational system [12–14].

The Patrice Lumumba Peoples' Friendship University of Russia (RUDN) is a multidisciplinary university, the alma mater for students from 152 countries of the globe. On the one hand, this creates additional opportunities for the cultural enrichment of the students; on the other hand, it forms specific challenges in supporting their health including language barriers, adaptation complications, differences in the cultural approaches to health and perception of medical services [15, 16].

The RUDN had a Clinical Diagnostic Center (CDC), healthcare center and several other medical divisions including the university clinical hospital. Despite these resources, the integral model of medical and preventive care to students that would unite these components in an effective manner has yet to be created. At the moment, the academic medical cluster is formed that would have to assume responsibility and respond to all the healthcare needs of the students and the faculty.

AIM

To identify students' needs for medical and preventive care, identify barriers to access to medical services, and assess readiness to implement the integrated University of Health model using the example of the RUDN University.

MATERIAL AND METHODS

This study is a descriptive cross-sectional sociological study planned and performed with the generally accepted standards of social-hygienic monitoring. The choice of this design is accounted for by the need to obtain a cross-sectional concept of prevalence of various health metrics, student behavior and needs in medical and preventive care at certain moments. The main tool to obtain information was sociological surveys implemented by questionnaires. It enabled an outreach to a representative sample, collection of systematized data from the general aggregate, collection of systematized data across a wide range of questions on the health status, behavioral risk factors, lifestyle, availability and use of medical services, as well as of attitude towards innovative integrated models of medical care.

The study was performed at the Patrice Lumumba Peoples' Friendship University of Russia. The data were collected for four weeks in September 2025. This period allowed minimizing of the impact of seasonal fluctuations of health condition and avoiding periods of maximum academic load, that could have adversely influenced the quality and the completeness of responses. The questionnaire was made in the Russian language and later professionally translated into the English language to ensure its accessibility for foreign citizens without a proper command of Russian.

The general population of the study were full-time students from their first to sixth year taking master's, resident's and postgraduate courses. It was divided into five majors (medical, engineering-technical, humanitarian, scientific and economic), which ensured high heterogeneity across educational profiles.

Inclusion criteria: students of at least 17 years of age, capable of reading and filling out the questionnaire in the Russian or English language, providing a written informed consent to participate in the study.

Exclusion criteria: students not enrolled in full-time courses, students on academic leave, providing responses

not to all questions, students demonstrating obvious signs of careless, random or deliberately incorrect responses to questions in the questionnaire (e.g., identical responses to all questions or logically incompatible combinations of responses).

The sample size was calculated in compliance with principles of mathematical statistics in order to provide sufficient power of the study. The calculation included the following parameters: confidence interval 95% (α = 0.05), statistical accuracy of the study 80% (1-β = 0.80), allowed error of sampling ±4%, which is standard for sociological surveys of this scale, and the tentative share of the feature in the general sample of p = 0.5 (the maximum conservative evaluation providing the maximum required sample volume). The application of the calculation formula enabled the calculation of the minimally required number of 600 respondents. As the result of the study, the total number of respondents was 682 people, which exceeded the minimally required amount and provided an adequate power for all planned analyses.

The participants of the study were selected by stratified random sampling. This approach ensured a proportionate representation of all significant subgroups of the general total and prevented a systematic shift of results. The general total was stratified by three major features: 1) year of study, since the students of different years may have significantly differing needs in medical and preventive care depending on their adaptation to the university; 2) faculty or major, considering that students from the medical major have a higher awareness of health care; 3) citizenship (Russian or foreign), considering potential differences in cultural aspects.

Within each stratum, the respondents were selected by simple random sampling using pseudo-random number generation algorithm (a function of SPSS Statistics 26.0). The size of each stratum in the sample was proportionate to the size of the respective stratum in the general total of the RUDN, which ensured that the final sampling was representative.

At the outset of the study, invitations were sent to 780 students selected under the above mentioned procedure of the stratified random sampling. Consent for participation was obtained from 722 students (92.6% of all invited individuals). Later, 710 students returned their completed questionnaires (91.0% of invited individuals). Following the data quality control (checking of completeness of questionnaire fill-out, logical consistency of responses and lack of signs of careless completion), the final analysis included 682 students or 87.3% of the initial number of invited individuals and 96.1% of individuals who returned their questionnaires. The high percentage of responses shows good motivation of the students to participate in the study and good quality of research procedures.

In order to collect the data, the authors developed a complex structured questionnaire. It was based on consultations with experts in the sphere of healthcare and student medicine, and on a tentative pilot test on a sample of 50 students not included in the main study.

The questionnaire consisted of 60 questions organized in nine logically connected sections. Section 1 contained 10 questions to collect social-demographic and social-economic characteristics of respondents. Section 2 had 10 question on self-assessment of health and on behavioral risk factors. Section 3 had 8 questions on social determinants of health. Section 4 had 13 questions on the use of medical services including awareness of the RUDN CDC. Section 5 had 6 questions to study awareness of the concept of the University of Health integrated model concept. Section 6 had 5 questions on the needs of students in prevention services. Section 7 was a set of questions of the WHO validated EQ-5D-5L questionnaire including five dimensions of quality of life (mobility, self-care, regular activities, pain/discomfort, anxiety/depression). Section 8 had 2 questions on the students' informational needs. Section 9 had 3 open questions to allow students formulate proposals to improve medical care, remarks, and provide additional comments.

Statistical processing of data was performed in the SPSS Statistics v. 26.0 (IBM, USA) with additional R ver. 4.0 for specialized analytics, and in Microsoft Excel 2019 for data preparation and visualization. The level of statistical significance for all tests was set at $p < 0.05$.

RESULTS

The sample demonstrated high representativeness in the main social and demographic parameters and adequately reflected the structure of the student population of the university. The gender distribution showed a slightly higher percentage of women (n=367, 53.8%) over men (n=315, 46.2%), which matches the general trend in the Russian higher education. In terms of age, the most numerous group comprised students aged 20–22 (n=265, 38.9%), which is logically explained by the distribution across years of study. In terms of citizenship, the sample included a majority of Russian (n=489, 71.7%) over foreign citizens (n=193, 28.3%), which reflects the distribution in the student community of the RUDN. In their majors of study, the students represented the medical (26.7%, n=182), humanitarian (24.6%, n=168), engineering and technical (23.8%, n=162), scientific (19.9%, n=136) and economic (5.0%, n=34) majors. The detailed distribution of the sample across all social and demographic features is shown in **Table 1**.

The analysis of self-assessment of health revealed a positive perception of the health condition by students. The majority of students estimated their health as good (308 students, 45.2%) or excellent (191 students, 28.0%), making a total of 73.2% of the sample with a positive self-assessment of health (95% CI: 69.7–76.5%). At the same time, a substantial part of students (183 students, 26.8%) indicated presence of health problems and estimated their health as satisfactory (136 students, 19.9%), bad (38 students, 5.6%), or very bad (9 students, 1.3%).

The level of physical activity of the students was lower than expected. The majority of students (n=268, 39.3%) had a low level of physical activity practicing sports less than twice a week or not practicing sports at all. The distribution of activity levels was as follows: 2-3 times a week for 237 students (34.8%), 4-5 times a week for 136 students (19.9%), daily, for 41 students (6.0%), once a

Feature	N	%	95% CI	Feature	N	%	95% CI
Sex				**Citizenship**			
Women	367	53.8	50.0–57.5	Russian	489	71.7	68.2–75.0
Men	315	46.2	42.5–50.0	Foreign	193	28.3	25.0–31.8
Age, years				**Study major**			
17–19	122	17.9	15.1–20.9	Medical	182	26.7	23.5–30.1
20–22	265	38.9	35.2–42.7	Humanitarian	168	24.6	21.6–27.9
23–25	187	27.4	24.1–30.9	Engineering and technical	162	23.8	20.9–27.0
26–35	108	15.8	13.2–18.8	Scientific	136	19.9	17.1–23.1
Year of study				Economic	34	5.0	3.5–6.9
Year 1	122	17.9	15.1–20.9				
Year 2	163	23.9	21.0–27.1				
Year 3	156	22.9	19.9–26.1				
Year 4	102	15.0	12.5–17.8				
Master's course	139	20.4	17.6–23.5				

Notes: CI – confidence interval (95%), n – absolute number, % – relative frequency
Примечания: ДИ – доверительный интервал (95%), n – абсолютное количество, % – относительная частота.

Table 1. *Socio-demographic characteristics of the sample (N=682)*

Таблица 1. *Социально-демографические характеристики выборки (N=682)*

week for 102 students (15.0%), less than once a week for 68 students (10.0%), no sports activities for 102 students (15.0%). Only 196 individuals (28.7%) had a high level of physical activity (4-5 time a week or more), which shows the necessity of promotion of physical activities among student youth.

Students' nutrition, assessed by frequency of consumption of fruit and vegetables, showed insufficient consumption by the majority of population. Only 136 students (19.9%) consumed fruit and vegetables daily, 171 students (25.1%), 5-6 days a week, 171 students (25.1%), 3-4 days a week, 136 students (19.9%), 1-2 days a week, and 68 students (10.0%) never consumed fruit and vegetables. Generally, only 45.0% (n=307) students consumed fruit and vegetables more than three days per week, which necessitates improvement of nutrition habits among the student population.

The duration of sleep for students is a significant problem. The average duration of sleep was 6.9 ± 1.8 hours, while the WHO recommendation is 7–9 hours for adult young individuals. Almost half of the students (n=340, 49.8%, 95% CI: 46.0–53.6%) slept less than the recommended number of hours. Thus, 56 students (8.2%) slept less than 5 hours, 130 students (19.1%) slept for 5-6 hours, 173 students (25.4%) students slept for 6-7 hours. Two hundred students (29.3%) had adequate hours of sleep (7-8 hours), 102 students (15.0%) students slept for 8-9 hours, and 41 students (6.0%) slept for more than 9 hours. Thus, chronic sleep debt is a widely spread problem among the student population of the RUDN. It correlates with high levels of stress and may significantly affect the quality of life.

The levels of stress related to academic activity was quite high. 286 students experienced stress often or very often (42.0%), 239 students experienced stress sometimes (35.0%), seldom, 102 students (14.9%), never, 55 students (8.1%). Thus, the absolute majority of students (77.0%) experienced some or other degree of academic stress, and 42.0% experienced it often or always.

The analysis of socioeconomic factors affecting the health of students revealed considerable differences in the material circumstances of living. Good material status of families was reported by 238 students (34.9%), average, by 307 students (45.0%), difficult, by 102 students (15.0%), and very hard, by 35 students (5.1%). It is to be noted that the influence of financial difficulties on their health was admitted by 165 students (24.2%), showing a direct correlation between the economic factors and perception of health status. This fact emphasizes the importance of accounting for socioeconomic determinants in the development of health improvement programs for students.

Availability of time to rest and recreate is a critical factor for health maintenance. 136 students (19.9%) responded often having the time to rest, 273 students (40.0%), sometimes, 205 students (30.1%) rarely, and 68 students (10.0%), almost never. Thus, 40.1% students had limited time to rest, which correlates with a high level of stress and creates prerequisites for the development of psycho-emotional problems.

Access to sports facilities in the universities was assessed as available and actively used by 82 students (12.0%); 273 students (40.0%) students responded "access to sports facilities is available, but I use them rarely"; 136 students (19.9%) responded "access to sports facilities is available, but not convenient for me"; 136 students (19.9%) reported limited availability of sports facilities, and 41 students (6.0%) reported "no access to sports facilities". Despite the availability of sports and recreation facilities at the university, the same are under-utilized by the students. This may reflect organizational complications and low motivation of the students.

The use of services of the RUDN Clinical Diagnostic Center by students reveals a considerable gap between the awareness and the reality. The awareness of the availability of the CDC was high: 205 students (30.1%) knew about the CDC and sought care, 273 students (40.0%) knew about it but did not seek care in it, 136 students (19.9%) heard about it, and only 68 students (10.0%) were not aware of its existence. Thus, 89.4% (610 students, 95% CI: 87.0–91.5%) of students were aware of the existence

of the CDC at the university to some extent; at the same time, this high degree of awareness did not convert into the respective use of services for the majority of student population.

The actual use of CDC services by the students within the past year showed the following distribution. Thus, 82 students (12.0%) appealed to the CDC several times (over 5 times per year); a few (2–5) times, 137 students (20.1%); once, 123 students (18.0%). In total, 360 students (52.8%, 95% CI: 49.0–56.6%) appealed to the CDC at least once within the past year. At the same time, 171 students (25.1%) never appealed to the CDC but wanted to, and 169 students (24.8%) never appealed to the CDC and had no wish to do so. In other words, half of the students (322 individuals, 47.2%) did not use CDC services within the studied period, despite their availability, which relates to main outcomes of the access difficulty analysis.

Among the students who did appeal to the CDC (n=360), the quality of services was assessed as follows. 71 students (19.7%) evaluated them as excellent, 145 students (40.3%) as good, 90 students (25.0%) as satisfactory, and 36 students (10.0%), as bad. Thus, 60.0% students (216 individuals), already using the CDC services, assessed them positively (excellent or good), which shows a rather high level of satisfaction among students who actually appealed to the CDC and implies that the major problem lies not in the quality of services but in their availability.

The analysis of barriers precluding students' access to medical services revealed a distinct structure shown in **Fig. 1**. Organizational barriers were the most significant (65.1% from all mentioned obstacles), including the long wait for admission (20.1%), inconvenient working hours of the CDC (15.0%), remote location (12.0%), complicated appointment system (10.0%), insufficient information (8.1%). Medical barriers (38.3%) included a limited range of services (15.0%), insufficient number of profile specialists (10.0%), lack of psychological services (8.1%), low quality of services (5.3%). Financial barriers (16.0%) were expressed in a lesser degree: the high cost of services was mentioned by 68 students (10.0%), lack of insurance by 41 students (6.0%). Psychological barriers (20.1%) included shyness or fear of appealing to the CDC (8.1%), language barrier, for foreigners (7.0%), lack of trust to medical services (5.0%). Thus, the obtained data indicates the priority task of removing the organizational barriers in the development of the systems of medical care for students.

The correlation between the students' citizenship and the use of CDC services, shown in **Fig. 2**, revealed statistically significant differences. Russian students appealed to the CDC in 55.8% of the cases (273 students), while the foreign students did so in 45.6% of the cases (88 students, p=0.048). This difference may stem from language barriers and from the differences in the cultural perception of medical services and their availability.

The sanatorium and rehabilitation facility of the RUDN is used even less than the CDC. 55 students (8.1%) applied there more than once; 82 students (12.0%), only once; 136 students (19.9%) never applied there but would like to; 171 students (25.1%) were not aware of its existence; and 238 students (34.9%) never applied there and had no wish to do so. Thus, 60.0% of students either did not know about the existence of the sanatorium and rehabilitation facility or never used its services, which points at a critical need of raising awareness of this important resource.

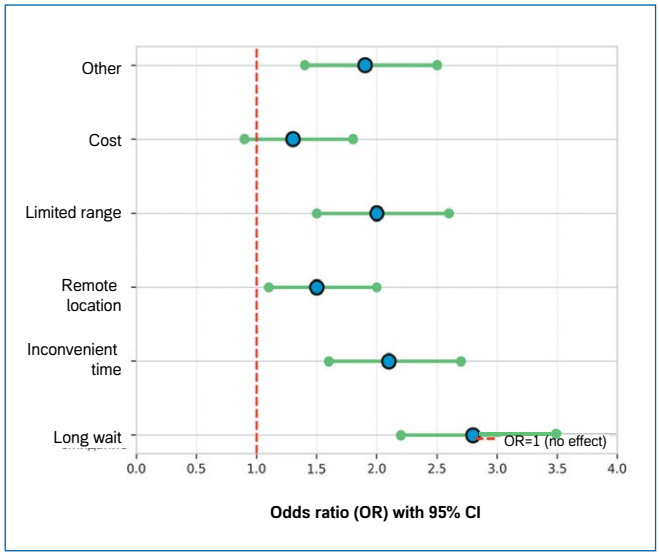

Figure 1. *Barriers to access to medical services.*
Рисунок 1. *Барьеры доступа к медицинским услугам.*

A comprehensive analysis of students' quality of life using the EQ-5D-5L questionnaire revealed significant differences in the distribution of problems across individual components. The use of the questionnaire provided an objective assessment independent of the subjective health self-assessment identified earlier.

The analysis of components showed a most favorable situation in the "Self-care" component, where 546 students (80.1%) had no problems, and 136 students (19.9%) had problems of various degrees of manifestation. "Mobility" was problematic for 205 students (30.0%), while 477 students (70.0%) experienced no limitations. "Habitual activities" were limited for 238 students (34.9%), while 444 students (65.1%) experienced no such limitations. The greatest problems were identified in the following components: "Pain/Discomfort" (273 students, 40.0% with problems), especially in the "Anxiety/Depression" component (305 students, 44.7% with problems, 95% CI: 41.0–48.5%). Thus, psychoemotional problems were the most prevalent among students, which aligns with the previously identified high stress levels and warrants serious attention in the development of health promotion programs.

The visual analog scale (VAS) of the EQ-5D-5L questionnaire showed an average score of 70.8±15.2 points out of 100 (95% CI: 69.6–72.0), with a median of 72 points (interquartile range 60–82). The distribution of students in their evaluations was as follows. The score of 90–100 points (excellent) was given by 82 students (12.0%); 70–89 points (good) by 308 students (45.2%); 50–69 points (satisfactory) by 205 students (30.1%); 30–49 points (bad) by 68 students (10.0%); below 30 points (very bad) by 19 students (2.8%). Thus, the average

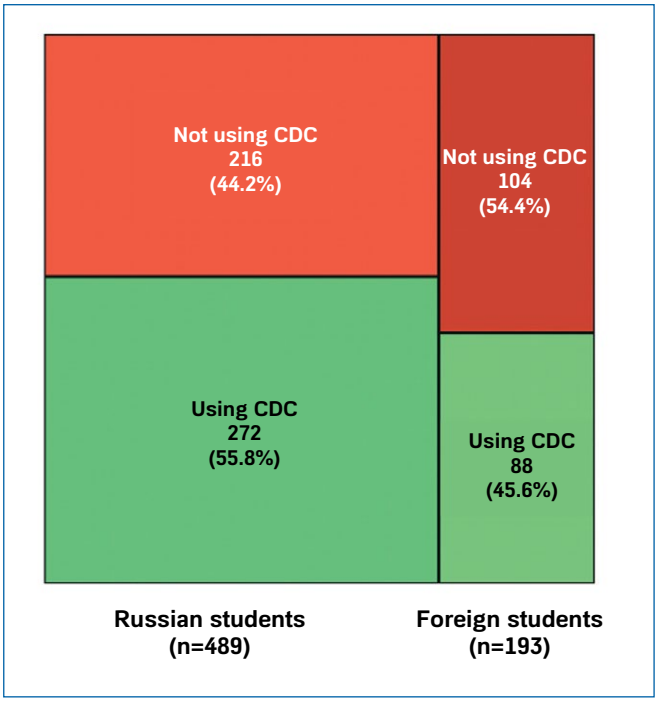

Figure 2. *Use of CDC services, by citizenship.*
Рисунок 2. *Использование услуг КДЦ по гражданству.*

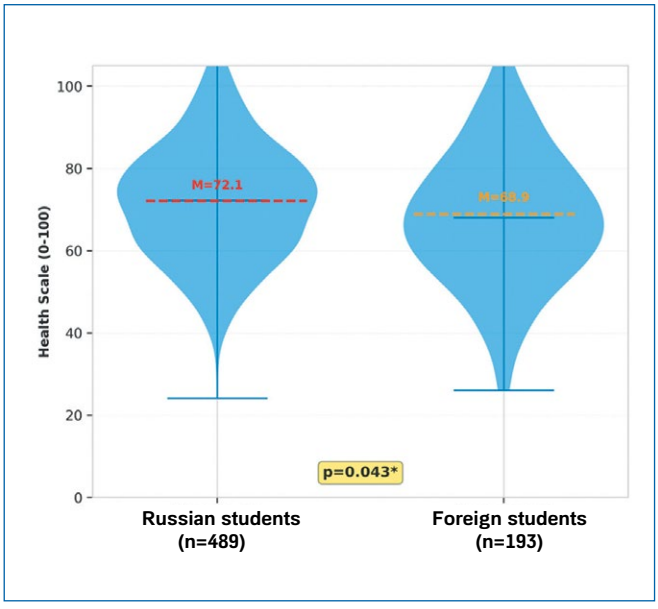

Figure 3. *Distribution of quality of life indicators (EQ-5D-5L VAS).*
Рисунок 3. *Распределение показателей качества жизни (EQ-5D-5L VAS).*

quality of life as per VAS was 70.8, showing a necessity of focused intervention to improve the outcomes, especially considering the fact that only 57.2% students assessed their health as good or excellent (**Fig. 3**).

Ideal health (understood as complete lack of problems in all five components of the EQ-5D-5L) was reported only by 76 students (11.1% of the sample, 95% CI: 8.9–13.6%), which indicates a high prevalence of some health problems or other among the student population. This result considerably differs from the high percentage of students (73.2%) giving a positive self-assessment of physical health that was identified earlier, which might reflect both an underestimation of existing problems by respondents and a difference between the physical and psycho-emotional components of health.

The comparative analysis of the results of the EQ-5D-5L questionnaire between the subgroups of students found some statistically significant differences (**Table 2**). The average score on the Health Scale for Russian students was 72.1±14.8 points and 68.9±15.9 points for foreign students, showing a statistically significant but clinically mild deterioration of quality of life on part of foreign students. No statistically significant differences were found between men and women (M=71.6±15.5 vs. 70.1±15.0, t=1.00, p=0.231). Students with a history of chronic diseases had significantly lower scores of quality of life (M=62.3±16.2) as compared to the students without chronic conditions (M=74.2±14.1, t=7.12, p <0.001), demonstrating a strong impact of somatic pathology on the psychosocial well-being. The students who appealed to the CDC for assistance had higher scores of quality of life (M=73.4±14.5) versus those who did not appeal there

Metric	Russian students (n=489)	Foreign students (n=193)	p	With chronic diseases (n=137)	Without chronic diseases (n=545)	t	p
Health Scale (VAS), M±SD, points	72.1±14.8	68.9±15.9	0.043*	62.3±16.2	74.2±14.1	7,12	<0.001***
Anxiety / depression, n (%)	208 (42.5)	97 (50.3)	0.067	80 (58.4)	225 (41.1)	χ^2=11.52	0.001**
Appealed to the CDC, n (%)	273 (55.8)	88 (45.6)	0.048*	98 (71.5)	265 (48.6)	χ^2=16.45	<0.001***
Sleep debt (<7 hrs), n (%)	231 (47.2)	107 (55.4)	0.034*	75 (54.7)	263 (48.4)	χ^2=1.89	0.156
High level of stress, n (%)	196 (40.1)	89 (46.1)	0.122	69 (50.4)	217 (39.8)	χ^2=5.04	0.024*
Smoking (any), n (%)	110 (22.5)	52 (26.9)	0.211	38 (27.7)	125 (22.9)	χ^2=1.37	0.234
Low physical activity (<2 times per week), n (%)	184 (37.6)	84 (43.5)	0.145	60 (43.8)	208 (38.2)	χ^2=1.36	0.234
Ready for the University of Health, n (%)	342 (69.9)	121 (62.7)	0.056	96 (70.1)	371 (68.1)	χ^2=0.23	0.634

*Notes: M – mean value; SD – standard deviation; t – Student's t-test. Significance level: * p <0.05; ** p <0.01; *** p <0.001. Chronical conditions: history of diagnosed chronic diseases. CDC – RUDN Clinical Diagnostic Center.*
*Примечания: M – среднее значение; SD – стандартное отклонение; t – t-критерий Стьюдента. Уровень значимости: * p <0,05; ** p <0,01; *** p <0,001. Хрон. болезни – наличие диагностированных хронических заболеваний. КДЦ – клинико-диагностический центр РУДН.*

Table 2. *Comparative analysis of EQ-5D-5L indicators between subgroups of students*
Таблица 2. *Сравнительный анализ показателей EQ-5D-5L между подгруппами студентов*

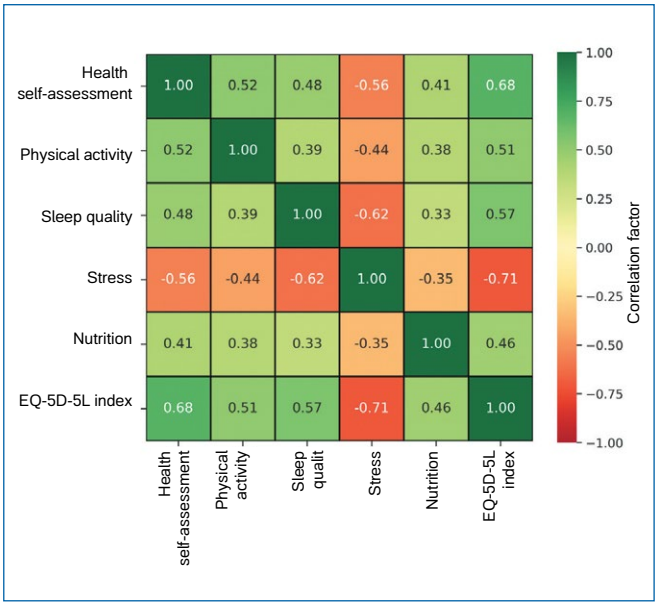

Figure 4. *Correlation matrix of student health factors (n=682).*
Рисунок 4. *Корреляционная матрица факторов здоровья студентов (n=682).*

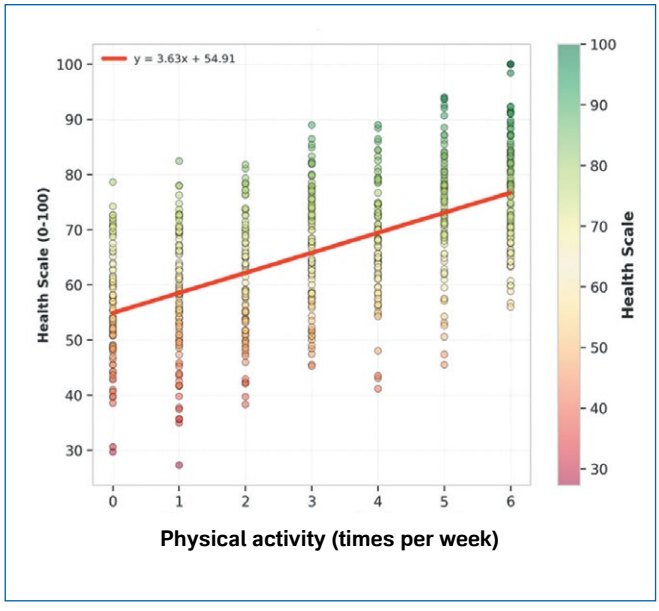

Figure 5. *Correlation of physical activity and quality of life, p <0.001.*
Рисунок 5. *Корреляция физической активности и качества жизни, p <0,001.*

(M=68.1±15.7, t=3.56, p=0.012), which may indicate a positive effect of the medical assistance received and a healthy behavioral choice of students ready to seek assistance in medical institutions.

The correlation analysis (**Fig. 4**) found statistically significant correlations between health components. The strongest reverse correlations were identified between the stress level and the quality of life score (r = -0.708, 95% CI: -0.744 – -0.669, p<0.001), emphasizing the critical importance of psycho-emotional well-being. The strong positive correlation was found between the self-assessment of health and the Health Scale score (r = 0.682, 95% CI: 0.639–0.722, p <0.001).

The quality of sleep showed strong negative correlations with stress levels (r = -0.624, p<0.001), which confirms the known mechanisms of mutual effect of these factors. Physical activity showed a moderate positive correlation with the quality of life (r = 0.518, p<0.001) (**Fig. 5**), indicating a proven positive effect of active lifestyle.

The students' awareness of the concept of the integrated medical cluster "University of Health" showed the following distribution. The concept was known to and understood by 123 students (18.0%); 239 students (35.0%) heard about it; 185 students never heard about it (27.1%); 135 students (19.8%) first learned about it within the study. Thus, 53.0% were to some extent aware of the concept of the "University of health", while 47.0% either were not aware of it or heard about it for the first time. This result indicates a necessity of raising the students' awareness of the possibilities of an integrated approach towards medical care.

The understanding of the concept of the "University of Health" by students was diverse and incomplete. Integrated medical services, as the core of the concept, were properly identified by 238 students (34.9%), promotion of healthy lifestyle was seen in the concept by 171 students (25.1%), expansion of sport possibilities by 82 students (12.0%), improvement of food habits, by 55 students (8.1%), combination of different approaches, by 82 students (12.0%), and 55 students were not aware of the concept (8.1%). Thus, only 34.9% of the students had a clear understanding of the integrated and systemic nature of the model, which shows the necessity of educational activities to improve the understanding of the concept.

The students' attitude towards the idea of integrated medical care within the concept of the "University of Health" was generally positive: 191 students (28.0%) expressed a highly positive attitude; 284 students (41.6%), a positive attitude; 137 students (20.1%) had a neutral attitude; negative attitude was expressed by 55 students (8.1%), and highly negative, by 15 students (2.2%). In total, 475 students (69.6%, 95% CI: 66.0–73.0%) had a positive attitude towards the idea of the "University of health", which shows a high potential of the implementation of this model into the practice of the university.

The students' readiness to use the services of the integrated model was even higher than the positive attitude towards the idea. 218 students (31.9%) were definitely ready to use such services; 244 students (35.8%) were rather ready to use the services; 150 students (22.0%) were neutral about using the services; 55 students (8.1%) were rather not ready to use the services, and 15 students (2.2%) were definitely not ready to use the services. Thus, 462 students (67.7%, 95% CI: 64.0–71.2%) expressed their readiness to actively use the services of the proposed integrated model, which shows the high demand and significant potential for the successful implementation of this project at RUDN.

Analysis of students' interest in various types of preventive services revealed differentiated needs. The greatest interest was shown in mental health screening (205 students, 30.1%), which logically correlates with the previously identified high prevalence of psycho-emotional problems and stress levels. Clinical examination interested

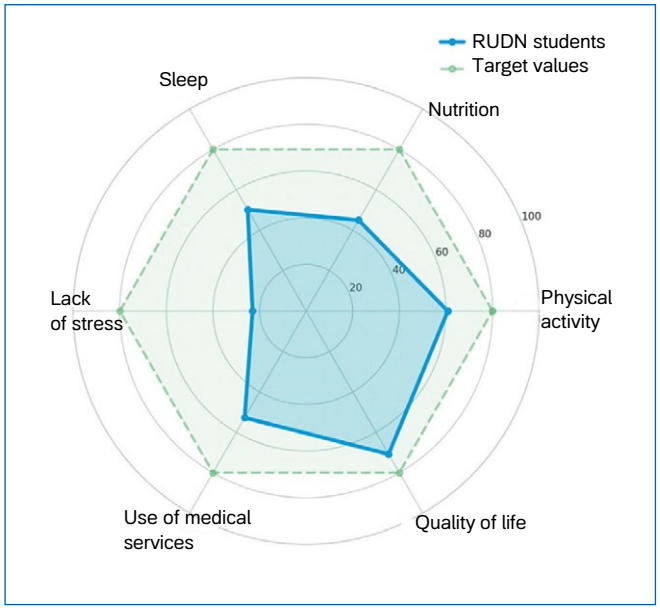

Figure 6. *Students' health profile (% or points).*
Рисунок 6. *Профиль здоровья студентов (% или баллы).*

171 students (25.1%); vaccination interested 136 students (19.9%); dental preventive care, 123 students (18.0%); sports medicine interested 102 students (15.0%). Less popular, yet still significant, were other types of prevention (gynecological, urological, nutritional care; prevention of dermatological, orthopedic, and gastrointestinal conditions), with interest ranging from 6% to 15%.

DISCUSSION

The present study revealed a complex picture in which high rates of subjective well-being among students coexist with significant objective psycho-emotional problems, insufficient physical activity, and unhealthy lifestyle patterns (**Fig. 6**).

An interesting observation was the paradoxical difference between the students' self-assessment of their health (73.2% students assessed their health as good or excellent) and the results of an objective measurement of quality of life using the EQ-5D-5L questionnaire (average score on the Health Scale 70.8±15.2 points, only 11.1% with ideal health). This discrepancy may be accounted for by several factors. First, the students, being young people, are prone to perceive their health condition from the standpoint of the lack of serious somatic diseases while underestimating psycho-emotional problems, especially prevalent in the student community. Second, the adaptation to the stressful educational environment may result in the normalization of high levels of stress and psycho-emotional tension as a 'normal' condition, which is reflected in the positive self-assessment. Third, students may be under-informed as to the components of quality of life that go beyond physical health.

The most significant outcome of the study is the high prevalence of psycho-emotional problems among students. According to EQ-5D-5L, 44.7% of students had problems with anxiety and depression, which increases the incidence of problems with mobility (30.0%) or pain (40.0%). This finding aligns with the growing number of studies demonstrating an increasing prevalence of psychic disorders including depression and anxiety disorders among students of higher educational institutions worldwide (Fig. 6).

The link between the high level of academic stress (77.0% of students experience some or other degree of stress, 42.0% experience is often or constantly) and psycho-emotional problems is confirmed by the significant negative correlation between the stress level and the Health Scale score ($r = -0.708$, $p<0.001$). The educational process in the higher educational institution contains many stress-inducing factors, including the highly intensive academic program, necessity of achieving high academic results, financial difficulties, uncertainty with respect to the future career and adaptation to the new social environment (especially for foreign students). Moreover, the chronic lack of sleep, a common problem for almost half of respondents (49.8% students reported sleeping less than 7 hours), is a well-known aggravating factor for psycho-emotional problems and burnout syndrome.

These findings indicate an urgent need for the development of specialized psycho-emotional support for students, including access to psychological counseling, stress management programs, and interventions aimed at improving sleep quality. It is to be noted that psycho-emotional support was identified by 30.1% of students as the most interesting type of preventive care, indicating a growing awareness of this issue among the students themselves.

One of the most important correlations in the area of use of medical services was the paradox of high awareness of the CDC (89.4% respondents knew of its existence) versus relatively low of actual use (52.8% respondents appealed there within the year). Logistic regression analysis demonstrated that student awareness of the "University of Health" concept was the most significant predictor of readiness to use integrated services (OR = 3.44, 95% CI: 2.12–5.58, $p < 0.001$). However, for awareness of the CDC, this effect was less distinct, suggesting a difference between knowledge of the service's existence and understanding of its value, as well as the formation of the habit of seeking care.

Analysis of access barriers revealed that organizational barriers dominate among the reasons for not using services (65.1%), including long waiting times for appointments (20.1%), inconvenient working hours (15.0%), and remote location (12.0%). Financial barriers (16.0% of all mentioned) were less significant than might have been expected, reflecting the presence of the mandatory health insurance system and the relatively well-off financial situation of the majority of RUDN students. However, 24.2% of students indicated that financial difficulties affect their health, pointing to a discrepancy between objective access (insurance coverage) and subjective perception of financial barriers.

Another interesting point is the difference in the CDC service use by Russian (55.8%) and foreign (45.6%, $p=0.048$) students that may reflect both the language barriers and cultural differences in the perception and use of medical services. The results indicate a necessity

of a specialized approach towards integration of foreign students into the system of medical care.

The study found a very high level of students' awareness of the necessity of an integrated approach to health. Thus, 69.6% students perceived the idea of the "University of Health" positively, and 67.7% expressed their readiness to use the proposed services. These results are considerably higher than expected and show that the RUDN student community is open to innovative models of medical care.

Logistic regression analysis revealed several interesting patterns in predictors of readiness for an integrated model. In addition to awareness of the concept (OR = 3.44), female gender was associated with increased readiness (OR = 1.25, p = 0.046), while foreign citizenship was associated with lower readiness (OR = 0.73, p = 0.018). The presence of chronic diseases, as expected, was a strong predictor of readiness (OR = 2.44, p < 0.001), reflecting the objective need for comprehensive care. Interestingly, each additional year of study correlated with a slight increase in readiness (OR = 1.09, p = 0.048), suggesting that senior students have greater experience interacting with the university healthcare system.

CONCLUSION

The results of this study have important practical consequences for the design of programs of health improvement for students and for the implementation of the "University of Health" innovative model at the RUDN. The obtained data show priority areas of development and form a reliable foundation for the planning of activities to improve the system of medical assistance to students.

Psycho-emotional support is to be regarded as the priority in the development of programs of health improvement for students. The implementation of evidence-based stress management programs is recommended, including elements of cognitive-behavioral therapy, relaxation techniques, and other methods with proven effectiveness for maintaining mental health. RUDN operates its own psychological service; however, it may become more in demand in the near future.

Overcoming organizational barriers while accessing medical services is one of the most perspective areas to introduce changes. The introduction of a modern electronic appointment scheduling system is recommended, enabling students to book appointments at their convenience. Additionally, it is advised to extend the operating hours of the CDC to accommodate students' diverse class schedules, along with the active development of remote consultations via videoconferencing. The latter is particularly relevant in the post-pandemic context and given the growing popularity of telemedicine among young people.

Integrating health promotion programs with the core educational process appears to be a strategically important step for achieving maximum coverage and effectiveness of preventive care. It is recommended to incorporate health-preserving elements into the mandatory components of curricula across all faculties. This should include not only traditional physical education but also a modern approach to health literacy, encompassing an understanding of health components, risk factors, disease prevention methods and principles of a healthy lifestyle.

Preventive activities and educational initiatives may take place during classes as short informational sections, interactive tasks and discussions. Integration of health-preservation elements into courses of humanitarian and social sciences is an especially effective approach: it is possible to discuss the social determinants of health, effect of lifestyle on well-being and psychological aspects of health. It is also recommended to develop facultative and elective courses dedicated to various aspects of health (e.g., psycho-emotional well-being, physical activity, healthy eating) that would attract motivated students and enable them study these questions in depth.

The high level of demand for the integrated model "University of Health" revealed in the study, combined with the students' clear need in psycho-emotional support, preventive medicine and comprehensive healthcare gives RUDN a unique opportunity to lead the way in the development and implementation of innovative approaches to preservation of students' health. Successful implementation of this model may become an example for Russian and foreign universities.

The results of the study show that with some specific conditions present it is possible to create an independent healthcare system that would readily respond to needs of young people and assist improvement of quality of life of students, which in its turn may have a positive effect on the quality of education and training of aspiring specialists.

ADDITIONAL INFORMATION	ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ
Consent for publication. All study participants signed a written informed consent form.	***Согласие на публикацию.*** Все участники исследования подписывали добровольное информированное согласие.
Study funding. The study was the author's initiative without external funding.	***Источник финансирования.*** Исследование выполнено по инициативе автора без привлечения финансирования.
Conflict of interest. The author declares that there are no obvious or potential conflicts of interest associated with the content of this article.	***Конфликт интересов.*** Автор декларирует отсутствие явных и потенциальных конфликтов интересов, связанных с содержанием настоящей статьи.
Statement of originality. No previously published material (text, images, or data) was used in this work.	***Оригинальность.*** При создании настоящей работы автор не использовал ранее опубликованные сведения (текст, иллюстрации, данные).
Data availability statement. The editorial policy regarding data sharing does not apply to this work.	***Доступ к данным.*** Редакционная политика в отношении совместного использования данных к настоящей работе не применима.
Generative AI. No generative artificial intelligence technologies were used to prepare this article.	***Генеративный искусственный интеллект.*** При создании настоящей статьи технологии генеративного искусственного интеллекта не использовали.
Provenance and peer review. This paper was submitted unsolicited and reviewed following the standard procedure. The peer review process involved 2 external reviewers.	***Рассмотрение и рецензирование.*** Настоящая работа подана в журнал в инициативном порядке и рассмотрена по обычной процедуре. В рецензировании участвовали 2 внешних рецензента.

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