

MODERN FACTORS DETERMINING THE STATUS OF STUDENTS' HEALTH

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Students belong to a special medical and social group. A risk of health disturbances is typical of this community. It is associated with the influence of various habitat and educational factors. The most significant factors have been determined based on the analysis of literature data. It is about high levels of stress and depression due to low physical activity, high level of psychoemotional stress during lessons and examination periods, irrational and irregular nutrition, social adaptation to a new habitat, which is often accompanied by acclimatization while moving for educational purposes, disorders of sleep and rest, harmful habits. Significant areas of development of self-preserving technologies for students were determined based on the obtained data. They can include as follows: examination of morbidity risk factors due to the educational period (from the first to the last educational year), assessing the effect of weather and climate conditions on the educational territory (examining the process of students' acclimatization), determining the role (peculiarities) of academic process technologies as a health risk factor (long-distance learning technologies, certain educational program), examining the progression and technology optimizing students' way of life at different stages of education, assessment of physical activity, influence on accessibility of educational programs, significance of using electronic devices and educational means, feeding trends (ethnic ones, conditions and possibilities of adherence to the principles of healthy nutrition), etc.

Keywords: students, examination period, lifestyle, nutrition, stress, sleep, adaptation, hypodynamia, gadget

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СОВРЕМЕННЫЕ ФАКТОРЫ, ОПРЕДЕЛЯЮЩИЕ СОСТОЯНИЕ ЗДОРОВЬЯ СТУДЕНЧЕСКОЙ МОЛОДЕЖИ

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Студенты — это особая медико-социальная группа. Для данного сообщества характерен риск нарушений здоровья в связи с влиянием различных факторов среды их обитания и обучения. Нами на основе анализа литературных данных определены наиболее значимые из них. Это высокая степень стресса и депрессии вследствие низкой физической активности, высокого уровня психоэмоционального напряжения в процессе занятий и во время сессий, нерационального и нерегулярного питания, социальной адаптации к новой среде обитания, часто сопровождающейся акклиматизацией при переезде в целях учебы, нарушения режима сна и отдыха, вредных привычек. На основе полученных данных определили значимые направления разработки здоровьесберегающих технологий для студентов. К ним можно отнести: изучение факторов риска заболеваемости в связи с периодом обучения (от первого курса к последнему), оценку вклада погодных-климатических условий территории обучения (изучение процесса акклиматизации студентов), определение роли (особенности) технологий учебного процесса как фактора риска здоровью (технологии дистанционного обучения, конкретная образовательная программа), исследование динамики и технологии оптимизации образа жизни студентов на этапах обучения, оценка физической активности, влияния на усвояемость образовательных программ, значимость использования электронных устройств и средств обучения, особенности питания (этнические, условия и возможности соблюдения принципов здорового питания) и др.

Ключевые слова: студенты, сессия, образ жизни, питание, стресс, сон, адаптация, гиподинамия, гаджет

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Соблюдение этических стандартов: исследование проводилось в соответствии с положениями Хельсинкской декларации и одобрено этическим комитетом Приволжского исследовательского медицинского университета, Российская Федерация, г. Нижний Новгород (протокол № 8 от 8 мая 2019 г.).

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The young people of today's Russia are the future and human resources of our country. Health protection of this group of people is a crucial task of our society and state [1].

Students belong to a social and demographic group of population with a certain count, sex-age structure, social position, role, status [2], intense mental labor, lifestyle and mental structure [3].

From a hygienic point of view, students' lifestyle has a number of shortcomings resulting in health worsening. The most widely spread ones include a high risk of developing stress and depression due to a low physical activity, high level of psychoemotional stress during lessons and examination periods, irrational and irregular nutrition, social adaptation to a new habitat, which is often accompanied by acclimatization while moving for educational purposes, disorders of sleep and rest, harmful habits [4].

The purpose of this review is to determine perspective trends of health-preserving technologies based on the scientific research devoted to assessment of environmental and habitat factors in students.

MATERIALS AND METHODS

30 articles considering the effect produced by various habitat and environmental factors on students' health have been reviewed. The articles published predominantly between 2015 and 2021 were searched through CINAHL, PUBMED, PSYCINFO, ELIBRARY and CYBERLENINKA.

RESEARCH RESULTS

In the modern society, a human health is the highest value. Various environmental factors influence a student's body during an educational process. Their amount is significantly increased now, with unsatisfactory material support, malnutrition and bad habits being of paramount importance. Secondary employment, stress, poor organization of leisure time, and lack of priority for health improvement produce a negative influence on students' health. These factors result in various functional disorders including stress, whereas a body's ability to adapt to the environment determines the level of health.

Owing to intense development of science and technology, global modern university education shows a steady trend towards an increased academic load and, as a consequence, towards a higher level of stress [5]. The specific weight of information overload was significantly increased during the educational process of students. In universities, intensification of the educational process is accompanied by a tense learning mode, increased academic load and negative influence on students' health.

The academic process is characterized by irregular distribution of load, increase in load during an examination period with the fact being a test for students, especially freshmen. It is proven that increased academic loads and requirements to students result in a growing level of state anxiety, and impaired mental capacity during the intersessional period. This leads to a worse level of adaptation and rise in cases for this social group. It is especially difficult for freshmen as they come across the methods of university education different from the school curriculum, and undergo the influence of social, mental, hygienic and behavioral factors of health disturbance risk [6].

Many researchers have shown that exam-associated stress is bad for students' health. This is a massive global trend. During the examination periods, high requirements are sometimes imposed on students' intellectual and emotional sphere. This results in overexcitation of the CNS and hypercompensatory nature of

adaptive responses. Constant functional over-stressing violently disrupts the balance between the adrenergic and cholinergic systems leading to their exhaustion. Such disorganization of the vegetative and endocrine systems is one of the leading reasons for the syndrome of vegetative dysfunction, cerebral and vascular abnormalities, and neuroses among students [7].

Students have a pronounced psychoemotional reaction to an examination period. Certain adaptive mechanisms are switched on during this time. They are manifested through physiological and psychological reactions of an organism to stress, thus, the level of state anxiety is increased [8]. Mental manifestations of stress influence the hormonal balance as well. For instance, salivary cortisol level in students is significantly increased prior to exams.

Examination stress is, by definition, mental strain, which occurs in students during an academic activity, right before an examination. It is often responsible for an examination neurosis and is an essential stressful factor. Difficulties, experienced by students while trying to understand the new educational system, are frequently accompanied with nervous tension, unnecessary irritation, low interest in doing things, impaired will activity, and anxiety. Stress experienced by students influences quality of education, acquisition and analysis of knowledge, and precludes academic progress. In its turn, academic difficulties produce discomfort as well, leading to increased general stress and higher level of morbidity in this social group [9].

The most frequent manifestations of stress in students are represented by changes of the cardiovascular and vegetative nervous systems. In students, neurasthenic disorders, illness anxiety disorders, and adaptation disturbances accompanied by anxiety and low mood make the largest contribution in the structure of the discovered disorders. This can result in frequent urination, liquid stool and abdominal pain [10]. Large mental burden in students can lead to altered central and peripheral hemodynamics, and subsequent formation of hypertensive conditions. Arterial hypertension is one of the principal risk factors of cardiovascular diseases.

Thus, early detection of students with high arterial pressure and their dynamic observation is a relevant objective of coronary heart disease prevention. In the early stages of the disease, arterial blood pressure is easily controlled using non-drug treatment and prevention modes [11].

It is interesting that students leading a healthy way of life and actively going in for sports are less prone to examination stress. It means that the level of physical activity is one of the most important factors influencing health [12]. Decreased motor activity, increased load to the visual analyzer and impaired adaptive values are correlated [13].

Hypodynamia is linked to increased fat mass, muscle mass and basic metabolism decrease, and altered homeostasis parameters. It is often associated with such harmful factors as smoking, alcohol intake, irrational nutrition, obesity, syndrome of anxiety and depression [14].

Gender specificities for the intensity rate of risk factors of chronic non-infectious diseases were found among students of secondary and higher educational levels. It is about smoking, arterial hypertension and excessive body mass in men, and hypodynamia, alcohol consumption and hypercholesteremia in women. Students of higher educational institutions commonly take alcohol and have irrational nutrition, whereas students of secondary technical schools and colleges prefer smoking [15].

Nutritional conditions belong to the most significant risk factors producing a negative effect on students' health formation. Obesity and hypodynamia are closely linked to students' nutritional status. There exists a serious risk that obesity of

the young is going to progress in an adult life predetermining a large-scale obesity epidemic during the next decades [16].

Tense mental labor of students places high demands on higher mental functions such as perception, memory, thinking, concentration and attentional capacity. High levels of physical and mental capacity need to be supported during an academic day. For this purpose, food ration of students needs to include enough proteins, fats, carbohydrates, vitamins, macro- and microelements so that all physiological systems of the body could function normally. It is known that students' nutrition is commonly not rational and not adequate. It is characterized by an altered biochemical and vitamin status. This can result in impaired natural resistance of students' body and be a reason for increased acute respiratory viral infection morbidity, especially in freshmen [17].

Obesity and type II diabetes hold a specific place in the list of metabolic diseases due to unhealthy nutrition. Their recent rate turns them into non-infectious epidemics. The majority of students eat not regularly and at random. Long intervals without food are followed by abundant nutritional load at night. Students have fast food which doesn't need much chewing, systematic overnutrition, junk food. The most frequent deviations in chemical composition and dietary energy supply include deficiency of animal protein, essential amino acids, polyunsaturated fatty acids, dietary fibers, various vitamins and mineral substances, excessive caloric content of food with predominance of fats and easily digested carbohydrates. These circumstances are typical both of Russian students, and those from near and far abroad [18].

The reasons for abnormal regimen and nutritional balance include a tight academic schedule, limited finances, and insufficient attention to health, which does not commonly pose a major challenge at this age [19].

Three factors such as late nutrition, irregular intake of hot food and meal frequency produce the largest influence on diseases of the gastrointestinal tract. The endocrine system is negatively influenced primarily by such two factors as late nutrition and meal frequency. Respiratory and urinary diseases are linked to meal frequency; CNS and cardiovascular diseases are associated with late food intakes. Apathy is influenced by three factors such as the time of last food intake, meal frequency, intake of energy drinks; increased fatigability is associated with two factors such as meal frequency and time of late food intake; late food intake is linked to cardiac pains; infrequent food intake is associated with dizziness; dyspnea occurs due to late food intake; heavy legs develop because of late nutrition [20].

There is a significant relation between the learning time at the university, prevalence of gastrointestinal tract diseases, and a number of students requiring dietary nutrition [21].

In students, hypodynamia is developed due to sedentary life style, including growing Internet addiction and online gambling in the modern youth [22]. There is a correlation between the time spent on computers and development of mental stress symptoms [23].

Because of long-term use of electronic devices, schoolchildren and students spent less time on sleep, motor activity, food intake, etc. The rate of using electronic devices by schoolchildren is an etiological constituent of acquired myopia. This is aggravated due to mass adoption of distant learning technologies for the purpose of an academic process. The learners use various electronic devices in areas not intended for such purposes that lack a sufficient level of illumination [24].

The consequence includes a negative tendency to the growth of general and primary eye disorder incidence among students, and a number of diseases from the first to subsequent years of education. Thus, students suffer from eye diseases more frequently than income-earning youths [25].

Healthy sleep is one of the most important factors influencing health, irreplaceable type of rest, enabling to restore body's defenses and energy resources. Students need enough sleep of good quality due to biological maturation and high academic and psychoemotional loads. Based on foreign literature, students report significantly worse sleep quality as compared with a general population. They have increased fatigue, excessive daytime sleepiness, anxiety and impatience. Every second surveyed Russian student reports the symptoms [26]. Sleep quality gets worsened during the examination period. It often happens during the exam term that students are deprived of a good sleep not to waste time. This influences their progress. Sleep disturbances are often observed in students with sleep-wake disorders or those with some personal or learning-related problems. Serious violations of rest and work regimen influence physical and mental health [27]. This assumption is especially true for those students who stay at a residence hall. Young people come across the new experience of staying at a residence hall, new sleep-wake schedule, and freedom from parental custody. They develop a new daily regimen, which includes not just preparation for classes, but also doing extracurricular activities, going to night clubs, working at night. This can significantly reduce the amount of sleep or deprive of sleep and produce a destructive effect on a student's body such as impaired learning quality at a university, and occurrence of a number of serious somatic diseases [28]. Thus, successful learning of educational programs and separate disciplines is impeded. The type of organizing an educational environment produces a great influence on intensity of emotional stress manifestations, sleep disturbances and characteristics of life quality subjective perception by students. It is established that freshmen are deprived of good sleep to a greater extent than senior students [29]. In students, bad quality of sleep depends on the level of stress. As a consequence of social adaptation, stress can be observed both during the first, and the last year of education due to the discomfort associated with transition to an adult life [30].

CONCLUSION

The study of health and its improvement in students is a global pressing issue. It is a human who is responsible for his or her health. Modern prevention, healthy way of life, responsible attitude to ourselves and others, selection of goods and services that produce no harm to health and environment belong to necessary conditions of health preservation and longevity, prevention of various diseases. According to the research, significant trends in health-saving technology development include as follows:

- examination of morbidity risk factors due to the learning period (from the first to the last years of learning);
- assessing the influence of weather conditions on the learning territory (studying the process of students' acclimatization);
- determining the role (peculiarities) of learning technologies as a health risk factor: distant learning technologies, certain educational program;
- examining the dynamics and technology of optimization of students' way of life at the stages of learning;
- assessing physical activity, influence on educational program accessibility;
- significant use of electronic devices and educational means;
- peculiarities of students' nutrition (ethnic ones, conditions and possibilities of compliance with the principles of healthy nutrition), etc.

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