Information technology in monitoring the health of Stavropol State Agrarian University students in the environmental conditions

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Abstract. The article discusses the features of the influence of the environmental situation on the state of human health. We revealed the necessity of monitoring students’ health with the use of information technologies as a factor influencing the training of future specialists and thereby improving the quality of education. The factors of optimization of the processes of preserving and strengthening the health of students of Stavropol State Agrarian University are determined. The tasks of the research are described, which consist in obtaining psychological information from monitoring the state of health of students, characterizing the educational process at the university, thereby ensuring the structuring of the system of psychological and pedagogical corrective measures.

Keywords: Information technology, Monitoring; Health; Ecological situation

1. Introduction
In modern society human health is formed under the influence of both internal factors – hereditary, given to him from birth, and external factors that can be favorable or harmful to health [1,2]. External factors are influenced by social and economic conditions of life. The social and economic conditions of life that affect the formation of human health must, first of all, include the density of the population of a certain territory, the development of the industrial sector, which have a great impact on the environment. Industrial enterprises, with their large number of emissions of harmful substances into the Earth’s atmosphere and water bodies, waste processing and dust settling, which contain substances toxic to humans, necessitate an integrated approach to the problems associated with environmental pollution [3,4,5]. There is an urgent need for a comprehensive study of the impact of anthropogenic factors on human health. The realities are such that certain environmental monitoring systems are being created to measure, assess and predict the reactions of the biosphere to technogenic load.

Environmental monitoring should be understood as a complex system that includes organizational structures, special techniques, methods of monitoring the state of the environment, changes in the environment, their consequences, as well as potentially dangerous for the environment, human health and the controlled area, activities, production and other facilities.

2. Informal statement of the problem
The statement of this problem is relevant and timely. According to the data provided by the World Health Organization, life expectancy varies in different countries. In Russia, the average life expectancy is 73 years, in European countries – 77 years, in the USA and Canada – 78 years, in Japan it reaches 87 years. To increase the life expectancy of a person, it is required an integrated approach to the problem under consideration. This process begins in the 60s of the 20th century and is determined by an increase in the number of diseases for all types of diseases [6]. Various changes constantly taking place in the country bring the population into a state of social and psycho-emotional stress and have a negative impact on the adaptive and compensatory mechanisms that are necessary to maintain people’s health, all this leads to an increase in the number of neuropsychiatric disorders, to alcoholism and drug addiction [7,8].

Preserving and strengthening the health of the country’s population, including the health of students in education, in modern socio-economic conditions is one of the priority state tasks of great importance. The most effective development of the Russian state can only be achieved by a healthy nation. This is especially true for the younger generation. In modern conditions of the development of higher education, one of the important tasks of Russian society is to ensure the protection and promotion of students’ health.

Domestic universities have accumulated a lot of experience in strengthening the health of students, however, at present there is a negative dynamics of their health status. In this regard, it becomes necessary to develop and implement informational monitoring of students’ health, including a comprehensive system of organizational and psychological pedagogical techniques, methods, technologies aimed at protecting and strengthening the physical, psychological, spiritual and moral health of students [9,10]. Monitoring is seen as a health management tool. Monitoring affects psychological health, physical health, social health, and spiritual and moral health.

At the present stage of development of society, with the introduction of information technologies in all spheres of human life, monitoring of health in an ecological environment using computer programs provides more complete knowledge about the object under study, the development of hypotheses, forecasting, as well as making the most effective decisions on issues related to health and health-saving technologies.

3. Discussion
The problem of the exceptional importance of a modern person’s health makes it necessary to include young people in solving issues related to strengthening and maintaining health.

Analysis of state documents (the Constitution of the Russian Federation, the Law on Education, the Fundamentals of Russian Legislation on Health Care, Federal State Educational Standards, the National Doctrine of Education in the Russian Federation) allows us to conclude that an important and priority task of the education system is to educate a person in a spirit of responsible attitude to their health and the health of others as the highest individual and social value.

Aspects of strengthening, saving and maintaining health occupy an important place in the scientific literature. Fundamental issues related to human health were disclosed in the works of T.I. Alekseev, V.Yu. Albitsky, V.A. Ananyev, V.N. Arkhangelsky, A.E. Baranov, P. Berger, A.G. Vishnevsky, V.S. Gapilina, E.I. Golovakha, T.M. Dridze, I.V. Zhuravleva, R.S. Karpinskaya, V.A. Kolychev, Yu.P. Lisitsin, V.M. Lupandin, K. Rogers, A.F. Sakho, A.M. Stochnik, E.T. Fadeev, V.N. Fedoseev, N.N. Fedorova, V.A. Yadov and others. The issue of health preservation was highlighted in the research of R.I. Aizman, L.I. Arkhipova, N.V. Goloborodko, L.V. Kosovanova, E.A. Levanova, N.K. Smirnov and others.

Theoretical studies of the idea of personality-oriented and activity-based approaches in teaching are reflected in the works of V.Yu. Albitsky, V.N. Arkhangelsky, S.F. Gulyanits, V.A. Dalinger, T.V. Dragunova, M.E. Kuznetsov, N.N. Nikitina, I. Yakimanskaya and others; the ideas of the competence-based approach are revealed in the works of O.V. Eremkina, N.V. Martishina, S.L. Troyanskaya, G.R. Yusupova and others.
The problems of a healthy lifestyle, the development of pedagogical technologies and models aimed at maintaining a healthy lifestyle are fully reflected in the studies of J.V. Bukharinova, E.N. Denisov, G.K. Zaitsev, E.A. Korobova, S.V. Mikhailova, S.G. Serikov, I.R. Murtazina, N.V. Nikitin, A.M. Pleschev, G.V. Chernova and others. In our opinion, it is necessary to take a more in-depth approach to the creation of a methodologically grounded and empirically tested model of step-by-step monitoring of the technology of a healthy lifestyle of educational activities in the higher education system.

Currently, when organizing the educational process in higher educational institutions, the monitoring system and assessment of the quality of students’ health are not implemented effectively enough and not consistently enough. One of the reasons for this is the lack of a functional understanding of the importance of maintaining health. In vocational education, curricula and programs of academic disciplines of the system of professional training of specialists are not designed from the standpoint of medical, psycho-physiological and pedagogical foundations of maintaining human health [2,4]. Among the significant factors determining the health of students, the following should be attributed:

- observing several processes changing in time at the same time or studying a large number of disciplines in a short time;
- repeated switching of attention from one object to another in a short period of time, frequent re-adaptation;
- perception and processing of a large amount of various information;
- lack of time to process information and make responsible decisions;
- increased responsibility for decisions made and neuropsychic stress;
- constant preservation of the intensity and tension of attention, memory, thinking, emotions;
- work in the evening and at night;
- small involvement of the apparatus of the motor analyzer (the work is performed mostly while sitting, does not require much physical effort).

For the effective training of highly qualified specialists with an optimal combination of the teaching load and the corresponding adequate psycho-physiological costs we use a system for monitoring a healthy lifestyle and its support in the educational process of the university. It operates constantly, at all stages of a student’s professional training, starting from the moment he/she/they make a decision about studying in the educational institution. The leading methodological principle of health monitoring can be considered a systemic problem-situational approach. It is designed to ensure the maximum possible correspondence of the measures taken for diagnosis, correction, prevention and counseling on emerging problems and the current situation in relation to the main links of the system “applicant – student – undergraduate – graduate student”. Therefore, the main task to be solved in the process of monitoring a healthy lifestyle of the educational process is to carry out a set of diagnostic, corrective and preventive measures with applicants, students, undergraduates, postgraduates.

The integration of educational and health-improving activities in the higher education system through the implementation of a conceptual model for monitoring a healthy lifestyle of educational activities of a university implies a scientific and theoretical justification and testing of a whole range of innovative information technologies that provide a solution to a range of problems of prevention, protection and health promotion throughout the entire period of study in a separate educational institution.

For their successful implementation, a set of mutually checking and complementary methods is used, they are adequate to the nature of the phenomenon under study:

- theoretical: medical and pedagogical analysis of statistical data on the health status of Russian students;
- empirical: conducting systematic monitoring studies of physical, psychological, social, spiritual and moral health.

The basis for monitoring the health of students is the technology of health-preserving education.

4. Results
At Stavropol State Agrarian University in 2016-2020, a psychological and pedagogical study was carried out on the topic: “The Program for Comprehensive Monitoring of Students’ Health”. When developing a program for studying the health of students, the motivational, emotional-volitional and intellectual development of the personality was taken into account and combined into a single whole. In total, 1,586 people took part in the study, students of all faculties of the university: Agrobiology and Land Resources – 186 people, Veterinary Medicine – 274 people, Socio-cultural Service and Tourism – 143 people, Agricultural Mechanization – 159 people, Biotechnology– 172 people, Accounting and Finance – 195 people, Economics – 261 people, Power Engineering – 196 people.

The subject of diagnostics “Program of Comprehensive Monitoring of Students’ Health” served the main areas of health: physical health, psychological health, and social health, spiritual and moral health. Today, it is difficult to do without the latest information technologies, therefore, for the study of physical health, the functional state of all organs and systems of the body, as well as for the diagnosis and activation and functional asymmetry of the cerebral hemispheres of students, the following methods were used: rapid acupuncture assessment using the device “Activator AC-6”.

In the study of psychological health: the balance of nervous processes (balance of excitation and inhibition), the level of emotional reactivity, rapid assessment, the profile of anxiety, frustration, aggressiveness and rigidity, diagnostics of psycho-emotional stress resistance, we used the device “Activator AC-6”.

The study of social health was carried out using test computer techniques: “Self-assessment of mental states” (according to Eysenck), the type of prevailing thinking (objective, symbolic, figurative).

Spiritual and moral health (the system of types of students’ values at the motivational and behavioral level): determination of internal conflicts in the value system; existing vacuums at the level of normative ideals and individual priorities. Characteristics of students’ life-meaning orientations were determined using computer questionnaires: V.M. Rusalov “Formal-dynamic properties of personality” (QFDPP), V.D. Mendeleevich “Test of antipatient consistency”, Spielberg-Khanin “Test for determining anxiety”, Sh. Schwartz “Review of values”, “Profile of personal growth”, questionnaires “Characteristics of the spiritual and moral health of students of Stavropol State Agrarian University”.

Studies have shown that more than half of the surveyed need some kind of psychological help in solving health-related issues. In connection with the solution of these tasks, a psychological service has been created at the university. The systematic organization of comprehensive monitoring of students’ health ensures the implementation of the following group of technologies – technologies for the formation of health-preserving and health-strengthening qualities of the individual, as a subject of the educational process. This direction involves the provision of materials and information to the subjects of the educational process to provide techniques and methods for optimizing health.

5. Conclusion
Currently, it is necessary to approach the issue of studying the ecological situation more carefully, since environmental pollution adversely affects the state of human health.

The data obtained by us monitoring the health of students of Stavropol State Agrarian University in the environmental conditions using modern information technologies made it possible to identify two main factors for optimizing the processes of preserving and strengthening the health of students:

1. Psycho-physiological – timely forecasting and correction of physical, psychological, social, spiritual and moral health.
2. Socio-pedagogical – harmonization of the psychological climate in student groups, providing assistance to students, especially freshmen in the period of active adaptation to study at the university.

Our research on students’ health has accomplished the following tasks: obtaining the most complete psychological information that characterizes the educational process at the university; providing this information in the most convenient form for users of various levels; ensuring the structuring of the system of psychological and pedagogical correctional measures.

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