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## THE RESULTS OF THE ASSESSMENT OF THE ADAPTIVE POTENTIAL OF THE CIRCULATORY SYSTEM IN STUDENTS

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**Annotation:** The assessment of the adaptive potential of the students of the Grodno State Medical University, as well as the analysis of health, was carried out. Based on the data obtained, it was found that the largest number of respondents (45.9 %) has a strain of adaptation mechanisms, including among boys 42 % and among girls 47 %. The third part of students (27.0 %) have a satisfactory character of adaptation, 8.3 % of respondents have a breakdown of adaptation. The data obtained indicate a significant variability in the adaptive potential of medical university students.

**Keywords:** adaptation, adaptive potential, variability, students

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## РЕЗУЛЬТАТЫ ОЦЕНКИ АДАПТАЦИОННОГО ПОТЕНЦИАЛА СИСТЕМЫ КРОВООБРАЩЕНИЯ У СТУДЕНТОВ

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**Аннотация:** Проведена оценка адаптационного потенциала у студентов Гродненского государственного медицинского университета, а также анализ здоровья. На основании полученных данных установлено, что наибольшее количество респондентов (45,9 %) имеет напряжение механизмов адаптации, в том числе среди парней 42 % и среди девушек 47 %.

Третья часть студентов (27,0 %) имеют удовлетворительный характер адаптации, у 8,3 % респондентов выявлен срыв адаптации. Полученные данные свидетельствуют о значительной вариабельности адаптационного потенциала у студентов медицинского университета.

**Ключевые слова:** адаптация, адаптационный потенциал, вариабельность, студенты

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**Relevance.** Adaptive capabilities of the body are increasingly considered as one of the important criteria of health. They reflect the degree of its dynamic equilibrium relative to the external environment. It is adaptation that is directly related to the background that ultimately determines the risk of developing diseases, and hence the level of health. The high pace of life, information loads and lack of time have an increasing impact and can be the causes of various deviations in the normal activity of the body's systems. This applies to people of all age groups, especially students. And even more so – students of medical universities who are in a state of high academic load and stress. One of the main tasks ensuring health promotion is the timely diagnosis of health, its quantity and quality.

The adaptive capabilities of the organism are one of the fundamental properties [1, 4]. First, the concept of "adaptive capabilities" is a stock of functional reserves that are constantly used to maintain balance between the body and the external environment. In turn, the reserve of functional reserves is information, energy and metabolic resources, the expenditure of which needs constant replenishment.

The circulatory system is responsible for the adaptation of the body to a large number of environmental factors. In most cases, the cardiovascular system acts as an indicator of the adaptive reactions of the whole organism.

Adaptive potential is an indicator of an organism's adaptability to changing environmental conditions and changes directly related to the organism itself. According to the results of numerous studies, it has been established that the adaptive potential is a sensory indicator of the state of human adaptation mechanisms, as well as an excellent tool for prenosological diagnostics [2].

In the framework of prenosological diagnostics, a decrease in the adaptive capabilities of the body is considered as the leading cause of the occurrence and development of the disease. At the same time, the natural age-related process of reducing the adaptive potential of the body can be significantly accelerated under the influence of a variety of external and internal risk factors, some of which, with their short-term sharp increase, can become causal factors of various disorders, disorders and pathological conditions [3, 5].

Currently, humanity is moving to a stage of development in which the number of people (not necessarily elderly) burdened with certain chronic diseases

is gradually, but rather quickly and confidently increasing. Usually, adaptation to life with a chronic disease occurs gradually throughout a person's life, affecting different aspects of his life, including many levels of functioning. The presence of a chronic disease in itself increases health risks, and reduces the adaptive capacity of the body.

It is possible to calculate the adaptive potential of the circulatory system by a certain set of indicators, which allows you to identify: groups with different levels of health; determine the potential ability of the body to adapt to the regime and physical exertion; identify the cause and direction of changes in the level of health, physical fitness under dynamic observation; decide on differential admission to physical exercises or the need for in-depth medical examination; determine the nature of recommendations and necessary measures. Assessment of indicators of adaptive potential is a very important approach to an objective assessment of the level of health and physical development and their changes under the influence of the daily routine.

**Purpose.** Провести оценку адаптационного потенциала у студентов Гродненского государственного медицинского университета, а также анализ здоровья на основании полученных данных, сделать соответствующие выводы.

**Materials and methods of a research.** The work used questionnaire, statistical research methods (using the program "Statistica" 9.0). When determining the adaptive potential, certain groups of indicators were studied, that is, anthropometric indicators of students, such as height, body weight, as well as indicators of the functional state of the cardiovascular system at rest (heart rate, blood pressure – systolic and diastolic).

To assess the adaptation process, the adaptive potential indicator (AP) was used, the calculation and analysis of which was carried out according to R.M. Baevsky, using the formula for calculating AP:

$$AP = 0.011 \times RHR + 0.014 \times AD \text{ syst.} + 0.008 \times AD \text{ diast.} + 0.009 \times \text{weight} - 0.009 \times \text{height} + 0.014 \times \text{age} - 0.27$$
, where: AP is the adaptive potential of the circulatory system; RHR – heart rate at rest; AD syst. – systolic blood pressure; AD diast. – diastolic blood pressure [1-5].

The respondents were students of the medical and pediatric faculties of Grodno State Medical University – 85 people aged 18 to 19 years (59 (69.4 %) – female and 26 (30.6 %) – male).

**Results and discussion.** It was found that 27.0% of all respondents have a satisfactory level of adaptation. Of these, 73.9 % are female, and 26.1 % are male. According to the test results, their overall score was less than 2.1. Satisfactory adaptation is characterized by a high or sufficient level of functional and adaptive capabilities.

It is shown that the majority of respondents (45.9 %) have a strain of adaptation mechanisms (2.11-3.2 points), of which 79.5 % are female, 20.5 % are male. Their functionality is provided by functional reserves.

It was revealed that 18.8 % of the subjects have an unsatisfactory character of adaptation, i.e. from 3.21 to 4.3 points. 81.3 % of them are female, 18.7 % are male. This group of people has a decrease in functional capabilities due to a violation of adaptation mechanisms – an unsatisfactory nature of adaptation.

The last group is 8.3 %, of which: female – 71.4 %, male – 29.6 %. According to the test results, these respondents scored more than 4.3 points. This group includes people with a breakdown of adaptations, i.e. having a decrease in functionality.

As a result of the study, it was found that 31.6 % of male respondents have satisfactory adaptation, 42 % have adaptation stress, 15.8 % have unsatisfactory adaptation, 10.6 % have adaptation failure; among female respondents, 25.8 % have satisfactory adaptation, 47 % have adaptation mechanism stress, 19.7 % have unsatisfactory adaptation, 7.5 % have adaptation failure.

Violation of adaptive capabilities occurs as a result of disruption of the usual rhythm of life, stressful situations, lack of time, eating disorders, mood swings, and so on. In our case, a huge role is played by the fact that the majority of students are not residents of the city of Grodno (88.2 % are visitors, 11.8 % are residents of Grodno). A rather abrupt change in external conditions (climatic conditions, the rhythm of life of a new city for them, physical and emotional stress) had a significant impact on their adaptive system. The presence of chronic diseases also played an important role for some of the respondents (29.5 %).

**Conclusions.** It is shown that the largest number of respondents (45.9 %) has a strain of adaptation mechanisms, including among boys 42 % and among girls 47 %. This makes up  $\frac{1}{2}$  of all the students tested. 27.0 % of students have a satisfactory character of adaptation. 8.3 % of respondents revealed a breakdown in adaptation. The data obtained indicate a significant variability in the adaptive potential of medical university students.

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