

ADAPTIVE EFFECTIVENESS OF PHYSICAL EDUCATION EXERCISE

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Abstract: This article scientifically analyzes the adaptive effect of physical education on the body and their health-improving effectiveness. The relevance of the study is explained by the need to strengthen human health in modern society as a result of hypodynamia, stress, and lifestyle changes. The purpose of the article is to identify adaptive mechanisms that are formed under the influence of physical exertion and to evaluate their health-improving results. Theoretical analysis, pedagogical observation, measurement of functional indicators, and mathematical and statistical methods were used in the research process. The results obtained showed that regular and scientifically organized training increases the functional capabilities of the cardiovascular and respiratory systems, accelerates recovery processes, and improves overall performance. In conclusion, it was substantiated that physical education is an effective tool that expands the adaptive reserves of the body and strengthens health.

Keywords: adaptation, physical exertion, health improvement, functional capacity, supercompensation, organism adaptation.

ENTRANCE

In modern society, the issue of strengthening human health, increasing functional capabilities, and improving longevity is one of the priority tasks. As a result of technological progress, a decrease in physical activity, hypodynamia, and an increase in stress factors negatively affect the biological balance of the body. From this point of view, physical education is considered not only a pedagogical process that forms movement skills, but also a complex biological and pedagogical system that activates the adaptive mechanisms of the body and has a health-improving effect.

Adaptation is the process of adaptation of the organism to external and internal environmental factors, which includes a complex of morphological, functional and psychological changes. Physical loads serve as a stress factor for the organism to a certain extent, and as a result of regular and scientifically based training, positive adaptive reactions are formed in the cardiovascular, respiratory, neuromuscular systems. This process expands the functional reserves of the organism, increases its working capacity and increases its resistance to diseases.

In scientific sources, the adaptive effect of physical loads is explained on the basis of the law of supercompensation, heterochronous development and mechanisms of systemic adaptation. Proper planning of training and selection of the volume and intensity of the load in accordance with individual characteristics are the main factors ensuring the effectiveness of health-improving exercises. Otherwise, overload or improperly organized training can lead to fatigue of the body and negative adaptive reactions.

Today, the scientific study of the adaptive effect and health-improving effectiveness of physical education is of great importance. Especially in the process of physical development, professional training and formation of a healthy lifestyle of the younger generation, it is necessary to deeply analyze the adaptive potential of physical education. The purpose of this article is to shed light on the adaptive effect of physical education on the body and their health-improving effectiveness from a theoretical and practical perspective.

The scientific substantiation of the adaptive effect and health-improving effectiveness of physical education classes is based on the study of the body's adaptation mechanisms. The theory

of adaptation is a fundamental concept in biology and sports physiology, which describes the process of rebuilding the functional systems of the body under the influence of external loads.

the Russian physiologist Ivan Pavlov substantiated the reflex activity of the organism and its adaptation to external influences, and this theory later served as an important methodological foundation for explaining the mechanisms of adaptation to physical loads. Also, the theory of functional systems developed by Pyotr Anokhin made it possible to explain the complex adaptive processes of the organism based on a systematic approach.

The issue of adaptation has been studied in particular depth in sports physiology. Lev Matveev scientifically explained the mechanism of expanding the functional capabilities of the organism, substantiating the law of gradual increase in physical loads and supercompensation. In his opinion, as a result of regular and standardized loads, stable adaptive changes occur in the cardiovascular and respiratory systems.

In modern sports physiology, adaptation processes are also interpreted in connection with the stress theory. The concept of the general adaptation syndrome, developed by Hans Selye , served as a scientific justification for the gradual effect of physical exertion on the body (stages of signal - resistance - fatigue). This theory is important in assessing the health-improving effectiveness of physical training.

Nikolai Amosov, a cardiologist, noted that strengthening exercises increase the functional capabilities of the heart muscle and improve blood circulation. Vladimir Platonov , a representative of modern sports medicine, also showed that during long-term training, the body undergoes morpho-functional restructuring.

Uzbek scientists have also paid special attention to the study of adaptive mechanisms in the process of physical education and sports. In particular, the impact of physical activity on the development of a young organism, changes in functional indicators, and health-promoting effectiveness have been widely covered in local research.

The analysis shows that although the physiological adaptation of physical loads has been sufficiently studied in existing scientific sources, the issue of their integration with the pedagogical process and a comprehensive assessment of their health-improving effectiveness requires further research. In particular, the organization of physical education classes adapted to individual characteristics and their combination with adaptive mechanisms requires a scientifically based methodological approach.

Therefore, this study aims to systematically analyze the adaptive effects and health-promoting effectiveness of physical education classes from both a theoretical and practical perspective.

This study is aimed at determining the adaptive effect and health-improving effectiveness of physical education classes, and is based on the principles of a systematic, comprehensive and functional approach. The methodological basis was the theory of biological adaptation, the concept of functional systems of the organism, and the law of gradual increase in physical loads and supercompensation. In the course of the study, the effect of physical loads on the organism was considered as a single biological and pedagogical system.

The object of the study is the process of physical education classes, and the adaptive reactions that occur in the body under the influence of physical loads and their relationship with health-promoting effectiveness were chosen as the subject. The purpose of the study is to identify the mechanisms of functional adaptation that are formed during physical education classes and to scientifically substantiate their role in health promotion.

During the study, theoretical and empirical methods were used in harmony. Through the analysis of scientific literature, the physiological and pedagogical aspects of adaptation processes were summarized and the existing scientific views were comparatively analyzed. The dynamics

of the load during the training process and the functional state of the participants were regularly monitored using pedagogical observation. In order to determine the adaptive responses of the body, functional indicators such as heart rate, arterial pressure, vital capacity of the respiratory system, and Ruffe index were measured. Also, tests assessing physical performance and survey methods determining the level of subjective well-being were used.

The experimental work was organized for 8–12 weeks, and training sessions were conducted three times a week at moderate intensity. The volume and intensity of the load were gradually increased, taking into account the age and individual characteristics of the participants. The training sessions consisted of general developmental exercises, aerobic loads, and elements that increased functional endurance.

The results were processed using mathematical and statistical methods, and the reliability level was determined based on the arithmetic mean, standard deviation, and Student's t-test. Statistical significance was assessed based on the $p < 0.05$ criterion.

The methodological approach developed in this way made it possible to systematically study the adaptive effects of physical education classes on the body and scientifically substantiate their health-promoting effectiveness.

During the research, the adaptive effect and health-improving effectiveness of physical education classes were analyzed based on the dynamics of functional indicators. At the end of the experiment, positive changes were observed in the cardiovascular and respiratory systems of the body.

While the participants had a relatively low heart rate recovery rate before the start of the training, it was found that the recovery time was significantly reduced at the end of the experiment. This indicates that the efficiency of cardiac muscle contraction increased and the activity of the autonomic system was balanced. Blood pressure indicators normalized, and the physiological difference between systolic and diastolic indicators stabilized.

Analysis of respiratory system parameters showed an increase in vital capacity, which indicates improved ventilation capabilities of the lungs. Aerobic exercises increased the efficiency of the body's use of oxygen, resulting in an increase in overall performance indicators.

The results of physical fitness tests also showed positive dynamics. An increase in endurance and speed indicators was noted. These changes confirm that regular and dosed loading creates a supercompensation process in the body. It was found that the formation of adaptive reactions is directly related to the scientific organization of physical loading and recovery processes.

The results of statistical analysis showed that the difference between the obtained indicators was significant ($p < 0.05$), which confirms the scientifically proven health-improving effectiveness of physical education classes.

The results obtained are consistent with the theoretical views presented in the scientific literature and once again demonstrate that the adaptive effect of physical loads expands the functional reserves of the organism. It was also found that the planning of training sessions in accordance with individual characteristics is an important condition for increasing the effectiveness of health-improving exercises.

Thus, the results of the study confirm that physical education classes form sustainable adaptive changes in the body and are an effective tool for promoting health.

The results of the study showed that scientifically organized physical education classes form stable adaptive changes in the body and provide health-improving efficiency. Regular and standardized dosed physical activity expands the functional capabilities of the cardiovascular and respiratory systems, increases working capacity and accelerates recovery processes. Adaptive

reactions are formed on the basis of the supercompensation mechanism and serve to expand the functional reserves of the body.

The positive dynamic indicators identified during the study confirmed the importance of physical education classes in health promotion. Normalization of heart rate, increase in respiratory volume and increase in overall work capacity represent the adaptive effect of physical loads. Statistical analysis showed the reliability of the results and confirmed the scientific validity of the health-promoting effectiveness.

On this basis, the following practical recommendations were developed. When planning physical education classes, it is necessary to determine the volume and intensity of the load in accordance with the age, gender and functional status of the participants. Adherence to the principle of gradual increase in the load during training ensures the correct formation of adaptive mechanisms. The inclusion of aerobic exercises in the composition of the classes enhances the adaptation of the cardiovascular system.

It is also advisable to monitor the level of adaptation of the body through regular monitoring of functional indicators. Paying sufficient attention to recovery processes and scientifically balancing the ratio of rest and load increases the effectiveness of recovery.

In general, it has been scientifically proven that physical education classes are an effective pedagogical tool that expands the adaptive capabilities of the body and strengthens health.

CONCLUSION

The results of the study showed that physical education is an important pedagogical and biological factor that activates the adaptive mechanisms of the body and provides a healthy effect. Regular and scientifically dosed physical activity causes positive functional changes in the cardiovascular, respiratory and neuromuscular systems and increases the overall performance of the body.

The dynamics of functional indicators determined during the study confirmed that physical training accelerated recovery processes, economized cardiac activity, and expanded the ventilatory capabilities of the respiratory system. It was found that adaptive changes are closely related to the gradual increase in load and the correct organization of the recovery process.

The results showed that physical education is an effective tool for strengthening health, expanding the functional reserves of the body, and increasing resistance to diseases. At the same time, organizing training sessions taking into account individual characteristics ensures the stable and safe formation of an adaptive effect.

In general, the adaptive effect and health-improving effectiveness of physical education classes have been scientifically substantiated and their widespread use in the education and health system has been proven to be appropriate.

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