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Scientific-Theoretical and Practical Foundations of Modern Physical Training in Physical Education and Sports

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ABSTRACT

In this scientific article, specialists working in the field of physical culture and sports today have a deeper understanding of the scientific, theoretical, and practical foundations of modern physical training in the world of physical culture and sports, as well as the level of knowledge of its features.

Keywords: Physical training, sports activity, personality culture, human qualities, flexibility, physical development, physical exercises, functional training.

INTRODUCTION

Today, physical education and sports serve as the main means of educating young people, who are the future of the country, to be patriotic, involved in the development of the country, and socially responsible. In this regard, one of our main tasks is the development of physical culture and sports, solving problems in this area through philosophical, legal, and sociological approaches, training competitive specialists in physical culture and sports, and improving their thinking.

METHODS

In the process of scientific research, methods of analysis, generalization, observation of scientific and methodological literature, systematic analysis of pedagogical and psychological phenomena, and generalization of results were used.

RESULTS AND DISCUSSION

In solving these problems, it is important to approach physical culture and sports as one of the means of education.

Also, one of the important tasks of the relevance of physical culture and physical training in our country should be recognized as the following:

- harmonious physical development of young children and adolescents, their physical readiness for successful work and military service;

- strengthening the health and increasing the work capacity of the population, developing the body's resistance to the effects of unfavorable factors;

- training and effective physical training of specialists performing professional duties in various extreme conditions;

- Ensuring the level of successful fulfillment of modern combat training tasks in the structures of the Armed Forces;

- rapid recovery of the body after diseases, injuries, various injuries arising in human health;

- prevention of age-related changes, ensuring the professional longevity of any specialists.

This very factor is the basis for the formation of such feelings as national pride, pride in the Motherland, honor, and national pride.

As we know, in recent years, Uzbek athletes have achieved remarkable results in the international arena: at the 2016 Olympic Games in Rio de Janeiro, at the 2021 Olympic Games in Tokyo, at the 2024 Olympic Games in Paris, they recorded high indicators among the countries of Central Asia.

However, the results of the use of mass physical education in our country lag behind the results achieved in the leading countries of the world. This is especially noticeable in terms of the number of people regularly engaged in physical exercises, the effectiveness of the means and training methods used, and the average life expectancy of the population.

At a video conference meeting chaired by the President of the Republic of Uzbekistan Shavkat Mirziyoyev on measures to further develop the Olympic and Paralympic movements, elevate mass sports to a new level, and increase physical activity among the population, it was emphasized that "according to studies, 44% of our population is not physically active, and 36% do not follow proper nutrition guidelines. In promoting a healthy lifestyle among the population, not only sports but also proper nutrition is of crucial importance." [1]

In particular, some important scientific and methodological issues of the application of physical exercises have not yet been resolved. The scientific substantiation of the mechanisms of influence of physical exercises on the human body and the current state of the theory of physical training do not fully correspond to the level of modern scientific achievements.

In recent years, a number of textbooks on the theory and methodology of physical education have been prepared in leading higher educational institutions of our country in the field of physical culture and sports. In these textbooks, the authors explain the influence of physical exercises on a person's subsequent professional activity and its theory of training. However, this theory does not have a modern scientific basis and does not take into account functional changes in the human body. In fact, it is these changes that determine the effectiveness of human activity. [2]

This problem is studied by fundamental science from the perspective of physiological adaptation and plays a crucial role in solving practical issues. However, among the numerous publications on the effects of physical exercises on the human body, scientific analysis of adaptive changes is present only in a few works. This lack of comprehensive analysis does not contribute to the effectiveness of physical improvement or the strengthening of public health. Consequently, it is not surprising that the physical fitness and health status of schoolchildren, students, military recruits, and adults are deteriorating.

Academician L.A. Orbeli also emphasized the importance and necessity of analyzing and taking into account adaptive changes in the organism. He stated: "It would be incorrect to limit the significance of biology in physical education solely to the study of the movement process. It is essential to consider all coordinating relationships that ensure the adaptation of all systems and functions of the organism to the performance of motor tasks." [3]

The existing theory of physical training does not take into account the processes of adaptation in the human body, limits the possibilities of applying physical exercises, hinders the development of the theory of physical training, and cannot ensure the effective solution of health-improving and practical tasks in modern society.

Undoubtedly, the absence of a precise scientific theory regarding the effects of physical exercises on human health, disease prevention, age-related changes, and the formation of the body's adaptive responses may negatively impact the outcomes of mass physical education.

Improving adaptive capabilities allows for the successful resolution of these issues. Until now, when substantiating the physical training of various specialists, the regularities of the course of adaptive reactions and the possibilities of strengthening them with means of physical training have practically not been taken into account.

Physical training allows for the improvement of important characteristics of the body:

- increasing functional capabilities;

- ensuring the efficiency of the functioning of physiological systems;

- increasing the body's resistance to adverse influences of the external and internal environment.

As a result, the ability of a person to adapt and the effectiveness of work in any activity and environmental conditions increases. This is of particular importance today for the training of specialists, military personnel, employees of all power structures, and specialists working on a rotational basis, performing tasks in complex climatic and geographical conditions.

Studies have shown that the stability of physiological functions, the ability of a person to work in extreme conditions of the external environment or professional activity, is ultimately determined not by the level of development of a particular physical quality or motor skill, but by the level of adaptive capabilities of the organism formed in the improvement of these qualities.

The formation of adaptive capabilities of the body is the main direction of preparing people for successful activity, effective adaptation to new natural and production conditions, in which the use of physical exercises is of great importance.

The effectiveness of any professional activity depends on the level of adaptability of the specialist. Only depending on the loads and stresses in the activity itself, the degree of adaptive capabilities can be different. Effective improvement of adaptive capabilities is ensured by physical exercises applied on the basis of the regularities of the formation of adaptive reactions. The principles of physical training, physical culture, and sports training are also based on the physiological laws of the body's activity and the laws of physiological adaptations.

Thus, the laws of adaptation form the theoretical basis of modern physical training, physical culture, and physical training. Through their effective application, it is possible to achieve high results in the physical training of specialists in any field and in the training of athletes in all sports.

Many athletes, world champions, and record holders, representing various sports, have used and continue to use the means and methods of improving the body's adaptive capabilities in the training process. Among them are Olympic weightlifting champion Yuri Vlasov, three-time world motocross champion Gennady Moiseev, wrestler Fedor Emelyanenko, Olympic champion and world record holder in the 800, 1000, 1500 meters and 1 mile (1609 meters) sprint, Englishman Sebastian Coe, and others.

In the athlete's training exercises, the main attention was paid to improving the mechanism of tissue adaptation (long-term adaptation). For this purpose, specific training tools were selected. Performing such exercises led to a significant lack of oxygen for a long time. This approach ensured the effective improvement of the mechanism of long-term adaptation and undoubtedly had a positive impact on the growth of sports results in middle-distance running.

It is also advisable to consider other scientific and practical issues related to the formation of adaptive abilities of a person.

Muscle activity influences all the functions of the body, increasing its flexibility, reliability, and resistance to unfavorable factors. This idea is based on the proven protective effect of adaptation to physical loads. That is, if a person is adapted to physical loads and easily copes with them, then due to the high adaptability of the body formed in the process of adaptation to physical loads, it can ensure high efficiency in any professional activity.

This explains the importance of physical culture at the present stage of society's development and the need to improve the adaptive abilities of each person. However, not all physical exercises are suitable for the effective formation of the adaptive capabilities of the human body and ensuring its high work capacity. The choice of such exercises is based on modern theories about the regularities of physiological adaptations.

Effective improvement of the body and expansion of its functional capabilities is achieved only through significantly high-intensity muscle activity. At the same time, a gradual increase in training loads facilitates the body's adaptation to them. From the point of view of the expediency of achieving the necessary results and assessing the functional capabilities of the trainees, both these regularities should be taken into account in the process of adapting the body to physical loads.

How is the effective formation of a person's adaptive capabilities and increasing their work capacity in professional activity carried out through physical training? Two stages are observed in the development of most adaptive reactions:

a) the initial stage of rapid, but imperfect adaptation;

b) the next stage of perfect long-term adaptation.

When exposed to various strong environmental factors or activities (which can occur during the performance of tasks in unusual conditions), the stability of the body's functions and a person's work capacity are ensured by identical systems - primary mobilization systems. If these systems provide a moderate response of the organism to environmental or functional factors, adaptation occurs in a shorter time and with less physiological expenditure, i.e., at a higher level of work capacity. Physical exercises can effectively increase the functional capabilities of primary mobilization (rapid adaptation) systems and thereby accelerate a person's adaptation to work activity, ensuring their work efficiency. How does this happen?

The primary physiological systems of mobilization include the cardiovascular, respiratory, and circulatory systems. They perform the function of supplying the body with oxygen. For the effective functioning of these systems (increasing their functional capabilities), it is necessary to use physical exercises involving a large number of large muscle groups, which are the main consumers of oxygen. Such exercises include running, skiing, cycling, and swimming. Another important indicator is the targeted strength of muscle work.

Analysis of work at various power levels (maximum, submaximal, large, medium) shows that the functional capabilities of the cardiovascular system, respiratory system, and blood are most pronounced at high power levels. High-powered muscle work allows for the effective improvement of the functional capabilities of these systems. High-intensity exercises include those that a person can perform for 5-6 to 20-30 minutes. These include a 2-6 km run and a 5 km ski race.

Thus, the application of exercises that enhance the functional capabilities of physiological systems for rapid adaptation and develop physical endurance can significantly strengthen the body's adaptive capacity, accelerate the processes of adaptation to work activities or the external environment, and improve a person's work performance.

A more advanced stage of long-term adaptation to the factors of professional activity is the adaptation of tissues themselves to effective work in conditions of reduced oxygen content in the internal environment and increasing their resistance. These phenomena are most pronounced when performing exercises of submaximal power, when the highest physiological changes occur, and when the work proceeds with a significant lack of oxygen. The duration of operation at submaximum power is from 20-30 seconds to 3-5 minutes. Such exercises include running distances from 200 to 1500 meters, crossing obstacle courses, and other similar exercises.

When considering long-term adaptation, it is essential to emphasize an extremely important principle of adaptation processes - the existence of a single adaptation mechanism at the cellular level for various factors. The significance of this principle lies in the fact that an organism adapted to a certain factor (for example, physical exertion) forms adaptive responses more favorably when conditions change (such as moving to high altitudes). This is because it already possesses an established adaptation mechanism at the cellular level. This allows for a faster transition of adaptive responses from the systemic level to a more advanced tissue level without a sharp decrease in performance capacity.

It should be noted that the amount of load (high and submaximum power) is unique for each person and depends on the functional capabilities of the body. This should be taken into account when conducting training sessions.

The theoretical and practical foundations of using physical training tools are as follows: the formation of adaptive abilities, accelerating people's adaptation to work activities and the external environment, and ensuring their work capacity.

For the most effective enhancement of adaptive capabilities, cyclic exercises are considered optimal. These exercises increase physical endurance and engage the body's numerous large muscle groups - the primary consumers of oxygen. Developing endurance is recognized as the only widely used method for strengthening health and preventing cardiovascular diseases.

This approach is relevant for all segments of the population. However, the choice of means and methods for developing physical endurance is extremely important, especially for elderly people with limited mobility and health problems. A necessary condition for resolving this issue is a medical examination of the health status of the

trainees, their functional capabilities, and the doctor's recommendations on the use of appropriate means and methods of training and self-monitoring. For such people, the main exercise may be moderate walking and other exercises they can perform.

Strength exercises have little effect on increasing the body's resistance to harmful influences, its adaptive ability, and improving the function of the cardiovascular and respiratory systems. Strengthening the muscles of the hands and torso is necessary for a person's successful performance of work tasks and harmonious development, but the development of endurance should be paramount. A living organism has two important characteristics formed in the process of evolution - the ability to adapt and the ability to maintain a high degree of adaptation of the organism, its vital activity for a long time. [4]

The ability to maintain a high level of adaptation ensures the health and work capacity of people at practically any age and in any conditions.

The research results show that the laws of adaptation form the modern theoretical basis of the influence of physical education, physical training, and sports on the human body. Well-founded methods of effective improvement of adaptive capabilities are modern practices of physical training for all segments of the population.

CONCLUSION

Thus, for the first time, the theory and practice of human physical training, based on the achievements of fundamental science, made it possible to ensure the successful fulfillment of tasks in modern society. This scientific approach serves to effectively strengthen the health of the country's population and ensure combat readiness in the field of military service. In this case, an objective assessment of the physical fitness of specialists for professional activity can be achieved not only by analyzing the achieved level of a particular physical quality, but also the state of the main physiological systems that ensure the adaptive capabilities of the body.

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