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# THE FUNCTIONAL CAPABILITIES OF THE STUDENT'S ORGANISM AND ADAPTATION TO PHYSICAL LOAD

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**Abstract:** Physical exercise activities are related to the functional capabilities of our body parts due to their specific characteristics. The article discusses the situation where a student, unaware of the level of functional capacity of their body parts, imposes excessive hysical demands on themselves, which can lead to a reluctance to engage in activities.

**Keywords:** Health improvement, physical exercises, functional capacity, cardiovascular system, training status, heart rate, physical load, experiments, heart volume, growth period, blood circulation rate, physical fitness, heart muscles, marathon running, rest, educational programs, educational process, physical qualities, student preparation.

Introduction

It is essential to nationalize physical education aimed at nurturing a healthy, well-rounded, and physically strong younger generation while developing their physical qualities. Therefore, scientifically studying physical qualities, incorporating them into school and preschool curricula, and elevating socially and educationally significant sports to a professional level are among the most pressing issues facing the field of physical education today.

Nurturing a spiritually enriched, morally pure, and physically developed younger generation is one of the most important tasks facing the field of pedagogy today. Developing the physical qualities of the younger generation is highly feasible. Therefore, our research topic, dedicated to exploring and developing new methodological approaches for utilizing physical qualities in the physical education of primary school students, is extremely relevant.

It is worth noting that President Shavkat Mirziyoyev's decree, issued on March 5, 2018, titled "On Measures for the Fundamental Improvement of the State Management System

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in the Field of Physical Education and Sports," emphasized the prioritization of developing physical education and sports and selecting (scouting) talented youth. This priority applies to preschools, general education schools, secondary specialized and vocational institutions, and higher education institutions.

**One of the core principles of this policy is the continuity and consistency of education.** This is why lifelong education is recognized as one of the key components of the National Model of Personnel Training.

Human health is above all else and more valuable than anything. Particularly, nurturing an individual to be healthy from an early age and raising them to become a well-rounded personality is even more valuable.

**Developing the younger generation intellectually, morally, and physically in all aspects** is of great importance, with physical education and sports playing a vital role.

For this reason, ensuring students' health, improving physical development, and enhancing physical readiness have always been pressing tasks in implementing essential principles within the physical education system

Literature Review and Methods

The issues of students' physical preparedness and physical development have been studied by many researchers. For instance, the studies of scholars such as F.N. Nasriddinov, R.S. Salomov, T.S. Usmonkhojayev, M.Y. Yunusova, Ye.Y. Bondarevsky, and F. Khojayev have identified aspects such as children's physical development, physical readiness, and low levels of physical activity.

At the same time, the field of pedagogy has consistently focused on the physical education of youth, addressing the problems of fostering a need and interest in physical education through regular activities.

In recent years, issues related to the physical preparedness and physical development of

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students and youth, as well as the physical education of the population, have been addressed by leading specialists of the Republic of Uzbekistan, renowned foreign experienced educators, and numerous scholars. These include V.K. Balsevich, O.V. Verkhoshansky, A.A. Gujalovsky, L.P. Matveyev, F.A. Kerimov, Sh.X. Khankeldiyev, L.R. Ayrapetyans, R. Salamov, T.S. Usmonkhojayev, K. Maxkamjonov, F. Khodjayev, K.D. Yarashev, and others, who have studied these matters from a theoretical perspective.

Some researchers, including D.D. Sharipova, G.V. Goshupkin, N.B. Bernshteyn, R.S. Salamov, A.T. Sodikov, B.G. Boyboboyev, V.V. Semenov, T.S. Usmonkhojayev, G.Y. Fokin, Sh.X. Khankeldiyev, V.P. Filin, V.I. Platnov, and others, have explored the effectiveness and possibilities of teaching general technical foundations of various sports exercises. They have sought to uncover different aspects of physical education and sports.

**Results and Discussion**

When we asked the question, "Is your body ready for exercise?" and "What methods can be used to assess your cardiovascular system?", 81.3% of the 70 ninth-grade students who participated in the survey responded that they did not know how to determine this, and 90% stated that they had not been taught the methods.

For those who had recently started exercising, after physical exertion (such as doing warm-up exercises, running, or other health-promoting activities), their heart rate did not exceed 130-150 beats per minute. Furthermore, when measured 10 minutes after the exercise session ended, the heart rate returned to the initial resting state. This was observed in the experimental group of 8th and 9th grade students from the first general education school in Kokand.

In the initial stage of our experiment, only 23% of students managed to return to their initial resting state within the expected time. Among the girls, this figure was around 15%.

The function of the body is closely related to heart activity. The rapid enlargement of the

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heart is observed between the ages of 11-18. Its longitudinal size increases threefold by the age of 15-17 compared to the size at birth.

The volume of the heart cavity is 250 $cm^3$ at the age of 13-15, and 250-300 $cm^3$ in adults.

Over a period of seven years (from 7 to 14 years old), the heart size increases by 30-35%, while in four years (from 14 to 18 years old), it increases by 60-70%.

The increase in the volume of the heart cavity occurs before the expansion of the blood vessels. The heart often lags behind the general growth of the body. It has been observed that 10-15% of boys and girls aged 15-20 have a relatively "small" heart, which leads to a prolonged recovery process of the body after physical exertion.

The heart rate at the age of 15 is 76 beats per minute, at 20 years old, it is around 65-70 beats for men, and 70-75 beats for women.

The rate of blood circulation is one of the main factors in providing tissues with oxygen. At the age of 14-16, the circulation time of blood is 18 seconds, while in adults it is between 17-19 seconds.

For strengthening the cardiovascular system, comprehensive physical readiness, strict regulation of physical loads, and gradual increases are of great importance.

For a person whose heart beats 70-72 times per minute and who is not physically conditioned, the heart will spend 20 years of its 60-year lifespan resting. It is estimated that in one day, the heart rests for 16 hours, the heart ventricle rests for 12 hours, and the heart itself rests for 4 hours (S.B. Lejnev).

The heart muscles, through regular exercise, adapt to increasing workloads, becoming slower (more efficient) in contraction, which saves time for the heart to rest. It has been observed that marathon runners' hearts beat only 40-50 times per minute.

Knowing how to assess the heart's adaptability to physical loads is an important aspect of understanding the functional activity of the body for a future healthy lifestyle (HLS)

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physical culture practitioner. This knowledge, as specialized theoretical knowledge, should be taught as part of the theoretical components of the physical education curriculum in general education schools.

One of the characteristics of a student's functional preparedness is the ability to accurately assess their heart's adaptability to physical loads and to practically apply this knowledge.

To assess the heart's adaptability to physical loads, the following procedure is used: the student sits quietly for 5 minutes, then within 15 seconds, they measure their heart rate and multiply the result by four to calculate the heart rate per minute. Following this, the student performs a full squat-and-stand exercise 20 times within 30 seconds. After completing the exercise, they wait for 2-3 minutes, then measure the heart rate again. If the heart rate returns to its initial state, it indicates that the student's heart is well-adapted to physical loads.

A physical culture practitioner who follows a healthy lifestyle must know how to assess their heart's adaptability to physical loads. They should also be familiar with breathing mechanism tests.

To determine the respiratory system performance of the experimental group of students, we used the following test: "Take two deep breaths, and after the third breath, hold the breath without exhaling." In adults, the breath-holding time should be 50-60 seconds, while in students (middle and high school age), it should be 30-40 seconds. There is a 10-15 second difference between women and girls.

In the experimental group (33 students), the results showed that 53.3% of boys and adolescents met the normal standards, while 46.4% of girls did.

The famous biologist Jean Lamarck, in his "First Law" (the law of exercise), stated, "Frequent and uninterrupted use of any organ gradually strengthens, develops, enlarges it, and the longer it is used, the more powerful it becomes. On the other hand, not using an

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organ regularly weakens it unnoticed, leads to its decline, narrows its possibilities, and ultimately causes its disappearance."

Jean Lamarck's groundbreaking law is one of the general laws of living nature. Later, Russian scholars such as P.F. Lesgaft, A.A. Uhtomskiy, I.P. Pavlov, G.F. Folbert, N.N. Yakovlev, and others studied it in greater depth, contributing significantly to the development of natural and medical sciences, and later to the theory of physical culture and related disciplines.

Those who are indifferent to physical development, lead a lifestyle with limited movement, or possess "low activity" levels experience the negative effects of the weak impulses generated by muscle inactivity on the central nervous system. These weak impulses primarily affect the brain and subsequently impact the function of other internal organs. Furthermore, this prolonged condition leads to a sharp decline in the energy reserves of nerve cells, weakening their immune defense, and increases the risk of developing various diseases such as gastrointestinal disorders, osteochondrosis, radiculitis, and others. Additionally, metabolic disruptions result in an increase in fat cells and body mass.

The consequence of excess weight is a lack of energy to support the musculoskeletal system (legs, arms), joints, heart, circulatory system, breathing, and other organs needed for carrying extra weight. This leads to illness and the rapid and inefficient expenditure of the body's vital reserves.

A high level of functional preparedness of the body serves as a foundation for physical activity (PA). However, the functional readiness of our organs is not solely dependent on physical activity but also on the body's biorhythms, which vary during the day, week, month, and other periods. In particular, the circadian rhythms are linked to our mood, mental state, work performance, and more, influencing whether they have a positive or negative effect throughout the day.

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Typically, the functional activity of the organism corresponds to the daytime and includes: from early morning, the function of the adrenal glands (located above the kidneys), which releases adrenaline and noradrenaline into the bloodstream. This affects the activity of our nervous system, either increasing or decreasing it, accelerates the heart's work, enhances the effectiveness of muscle contractions, regulates the gastrointestinal tract, body temperature, heart rate, blood pressure, and other necessary factors, and influences the maximal oxygen consumption. The body's functional state decreases to a minimum between 3:00 p.m. and 5:00 p.m. Biological rhythms positively affect our mental and physical work capacity twice throughout the day.

The first period of productive work occurs between 9:00 a.m. and 1:00 p.m., and the second period is between 4:00 p.m. and 6:00 p.m., which corresponds to an increase in the activity of our nervous system. A decrease in motivation for activity, poor mood, and indifference to the coach’s instructions are related to the biological rhythms mentioned above.

Some researchers believe in the existence of a 23-day physical cycle, others in a 28-day emotional cycle, and still others in a 33-day intellectual cycle. Each cycle is thought to have two halves: the first half marked by a “plus” (increased work capacity) and the second half by a “minus” (decreased work capacity).

Physical activity positively affects breathing and blood circulation. Exercise causes many small blood vessels to open up in the muscles engaged in the movement. During physical activity, the blood vessels expand, and blood flow accelerates. This results in the rhythmic contraction and relaxation of the muscles, which improves the blood flow through the venous blood vessels back to the heart, creating optimal conditions for it.

To summarize, it is essential to teach students how to assess their physical capabilities, including understanding heart function and basic knowledge of its physiology starting from the 5th grade. Simple tests for determining their adaptation to physical load, such as

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measuring the pulse to reach 130-150 beats per minute and observing recovery time after 10 minutes or after 20 sit-stand repetitions within 2-3 minutes, are crucial in today's education system. This knowledge will benefit students throughout their lives in the context of a healthy lifestyle (STT) and physical culture practices. For example, J. Lamarck's First Law should become an integral part of their lifelong physical culture approach. If you need more help with this or further clarification, feel free to ask!

**Conclusions:**

1. The concept of healthy lifestyle physical culture plays a distinct role within the broader phenomenon of a healthy lifestyle, encompassing its definition, content, structure, tools, methods, and principles. It rightfully deserves the recognition as a subject referred to as "Healthy Lifestyle Physical Culture."
2. Every individual should be able to maintain their health throughout life and achieve high work capacity during this period. This goal of mastering the "art of living" can be realized through healthy lifestyle physical culture activities. It must be instilled in the minds of students and transformed into a law of practice for specialists in this field.

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