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Assessment of the Physical Development of Those Involved in Sports Games

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Annotation: The paper discusses the basic concepts, signs of physical development and factors influencing it. Literature sources on this topic were analyzed, research methods were studied and an assessment of the physical development of those involved in sports games was carried out according to anthropometric indicators and functional tests.

Keywords: physical development, anthropometry, anthropometry, physiometry, functional indicators, spirometry, dynamometry, ontogeny.

Physical development is a complex of morphological and functional indicators that are closely related to physical performance and the level of the biological state of the individual at a given particular moment in time.

Heterochronism of growth and development of an organism influences the rate of physical development. Its definition is necessary for a qualitative assessment of the health status of each individual person. According to the dynamics of growth and development, one can judge health, physical and mental well-being.

The need for regular assessment of the level of physical development is to overcome possible diseases in the early stages of their occurrence. Health and physical development are closely related. Often a deviation from the norm of physical development is the first important symptom of both a functional state and an already existing disease.

Any deviations from the norm in physical development indicate a relative unfavorable state of health and should be taken into account, especially when doing physical culture and sports.

Evaluation of functional indicators enables the coach to correctly plan the load and build the training process. Therefore, this topic is relevant.

In modern conditions, it is especially important to monitor the physical condition, since more and more schoolchildren who have not previously been involved in sports, people of mature and old age with different levels of health and motor fitness are involved in physical culture and sports, as well as early sports specialization is being introduced [4, 8.13].

Under these conditions, constant monitoring of the physical condition is a necessary condition for the safety and effectiveness of physical education.

The main goal of assessing the physical condition is to obtain knowledge about the physical status of those involved and further use these data for an adequate choice of the type of physical activity, increasing the level of physical fitness and performance, maintaining and strengthening health, the correct construction of classes, fixing the changes that occur in the body under the influence of the load, timely correction of the educational process [4,13].

In this regard, the issues of assessing the physical condition of schoolchildren and its monitoring in the process of physical education are relevant.

The purpose of the study: to reveal the importance of the integral assessment of the physical condition of schoolchildren during physical education.

To achieve this goal, it was necessary to solve the following tasks:

1. Determine the level of physical development and physical fitness of children of primary school age (7-10 years old);
2. Determine the level of physical condition of schoolchildren;
3. To prove the importance of the integral assessment of the physical condition of schoolchildren during physical education.

It is known that physical loads of various intensity and direction lead to changes in the main indicators of the leading morphofunctional systems and the development of individual motor qualities. The most common method for assessing the effectiveness of the impact of physical exercises on the child's body is the control pedagogical testing of physical fitness or individual motor abilities [14].

Unfortunately, it is difficult to identify the level of adaptation of the body as a whole without special equipment.

At the same time, work experience has shown that almost all schools have a minimum set of equipment that can be used to obtain, using direct measurements and calculated indices, a sufficient amount of information about the adaptation of the children's body to a certain physical activity. For this purpose, it is enough to use the following tools: height meter, scales, centimeter tape, stopwatch, pressure measuring device, dry-air spirometer. It is necessary to measure and obtain information on six morphological and functional indicators, on 4-5 tests about the level of physical fitness of students, to determine the remaining indicators indirectly using calculated indices [2,3].

In the future, according to the level of development of the obtained indicators, an assessment of the physical condition of schoolchildren is carried out. The theoretical and methodological basis for determining the physical state of the body of schoolchildren was the concept of its comprehensive assessment, which was carried out by us in 5 blocks [6,7,11,15]:

- ✓ anthropometric or block of physical development (PD);
- ✓ block of the cardiorespiratory system (CRS);
- ✓ block of the state of the departments of the autonomic nervous system (ANS);
- ✓ block of maximum oxygen consumption (MPC);
- ✓ block of assessment of physical fitness (FP).

Anthropometric block included an assessment of body length and weight, chest circumference. The Quetelet weight and height index was calculated. Studies of these indicators were carried out according to generally accepted methods [2].

The block of the cardiorespiratory system was determined taking into account the level of vital capacity of the lungs, heart rate, blood pressure (systolic, diastolic, pulse, average). The formulas were used to calculate the systolic and minute blood volume [1,2].

Assessment of the state of the parts of the autonomic nervous system was carried out by a screening test according to the method of Kerdo [1].

The block of maximum oxygen consumption was determined by the absolute and relative values of the MIC, calculated by the screening test [9].

The physical fitness assessment block was carried out by the method of control pedagogical testing according to the indicators reflecting the level of development of the leading physical qualities:

- speed (test - running 100 m, s);
- strength (test for boys - pull-ups on the high bar from the hang, number of times; for girls - pull-ups on the crossbar in the lying position; sitting down from the supine position, number of times; flexion and extension of the arms in the lying position, count - once per minute);
- speed-strength abilities (test - standing long jump, cm);
- general endurance (modified K. Cooper test - 6 -minute run, m);
- flexibility (test - torso tilt forward from a sitting position, cm);
- motor coordination (test - throwing a tennis ball at a target, number of hits) [5].

To determine the integral assessment for this block, the total number of points of all indicators for the block was summed up, the total score was divided by the number of indicators studied.

To assess the physical condition, the total scores obtained in 5 blocks are summed up, the sum is divided by 5 and the integral score is determined [6,15].

The formula for calculating the physical state:

FS \u003d FR + KRS + VNS + IPC + FP

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Further, according to the table, the level of physical condition is determined (table No. 1).

Table No. 1 - Comprehensive assessment of the level of physical condition of schoolchildren aged 7-10, points

Blocks	Levels				
	short	below avg.	average	above average.	high
1. FR	1.5 and below	1.6 - 2.5	2.6-3.5	3.6-4.5	4.6-higher
2. KRS	1.5	1.6 - 2.5	2.6-3.5	3.6-4.5	4.6
3. VNS	1.5	1.6 - 2.5	2.6-3.5	3.6-4.5	4.6
4. IPC	1.5	1.6 - 2.5	2.6-3.5	3.6-4.5	4.6
5. FP	1.5	1.6 - 2.5	2.6-3.5	3.6-4.5	4.6
6.Overall score	7.9 and below 1 point	8.0 - 12.5 2 points	12.6 - 17.5 3 points	17.6 - 22.5 4 points	22.6 and above 5 points

To test the effectiveness of the integral assessment of the physical condition in determining the adaptation of schoolchildren to the effects of physical activity, we conducted a pedagogical experiment in which schoolchildren of grades 1-3 took part. Students were conditionally divided into experimental and control groups.

All schoolchildren were engaged in physical culture 3 times a week according to the generally accepted state program. Only the orientation of the variable part of the lessons, which consisted of folk games and their elements, was not the same for the control and experimental groups.

Before the start of the experiment, the level of development of morphological and functional indicators, physical fitness was determined among schoolchildren in the control and experimental groups, and, accordingly, an assessment of the physical condition of students was given. There were no significant differences between the students of the control and experimental classes in terms of the level of physical condition. Analysis of the results revealed the predominant presence of children with an average level of physical condition, but there were students with both a low and a high level. In the first grades, the average level of the integral assessment was 2.93±0.34 points in the control group and 2.97±0.47 points in the experimental group. In the second grades, respectively, 3.2±0.4 and 3.1±0.315 points, in the third grades - 3.3+0.4 and 3.1+ 0.25 points .

The analysis of the physical fitness block, which reflects the level of physical fitness, showed that in the first and second grades (both experimental and control) there were a large number of children with a low level of speed, jumping ability, coordination, and in the third, a large number of students with a low level of development of various types of endurance and coordination. The revealed difference served as the basis for the implementation of a differentiated approach in the direction of the variable part of the lessons.

In the first and second experimental classes, in the variable part of the lessons, folk games or elements of folk games were used that develop speed, jumping ability, coordination, and in the third grade - a large number of games and exercises that promote the development of various types of endurance and coordination. The folk game is a complex multidimensional phenomenon of active human activity from early childhood, which until now remains the focus of attention of scientists. Unfortunately, elements of folk games are not fully used in physical culture lessons in schools.

In the control classes, in the variable part of the lesson, a differentiated orientation was not carried out. In all these classes, folk games and exercises were used to promote the development of speed, coordination, endurance in the main or final part of the lessons.

After the experiment, the students of the experimental and control classes were again tested and determined the level of physical condition, taking into account age and gender, but during processing, the results are presented without taking into account gender.

The dynamics of the physical condition is reflected in table No. 2.

Table No. 2 - The dynamics of the physical condition of primary school students who took part in the pedagogical experiment

Classes	Physical condition, points		Growth rate, %
	Before the start of the experiment	After the end of the experiment	
1 class _ - exp. 1 class _ - counter.	2.93+0.34 2.97+0.41	3.5+0.21 3.3+0.53	19.45 11.1
2 cl . - exp. 2 cl . - counter.	3.2+0.27 3.2+0.31	3.6+0.32 3.45+0.47	12.5 7.8
3 cells _ - exp. 3 cd. - counter.	3.3+0.14 3.29+0.27	3.7+0.34 3.45+0.46	12.1 4.8

A comparative analysis showed that a positive trend was revealed in the level of physical condition of students in the experimental and control groups, but higher growth rates were noted in experimental grades 1-3.

There is no doubt that a differentiated, purposeful effect of physical exercises leads to more pronounced growth rates in the development of physical fitness [5,10].

The method of integral assessment of the physical condition of schoolchildren made it possible to assess not only the level of physical fitness, but also to trace the change in the adaptive potential of individual systems in each child. So, according to the average group values among the students of the experimental and control groups, there were no significant differences in the measurements of anthropometric indicators and individual motor tests. Unsignificant differences were noted in all groups in terms of respiration, the state of the cardiovascular system, regulatory mechanisms, and the level of BMD.

Thus, a comprehensive assessment of the physical condition allows an integral assessment of the effectiveness of the impact of physical activity on the body of schoolchildren, i.e. reflect the process of their adaptation.

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