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Developing Physical and Mental Activity in 5th to 7th Grade Students through Special Physical Exercises

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Abstract: *This article discusses the impact of special physical exercises on the physical and mental development of primary school students. It scientifically examines the role of physical exercises in stimulating students' motor activity, attention, and thinking abilities. The modern education system requires the all-around development of children. Especially in the early stages of education, the physical and mental abilities of children are developed in an interconnected manner. Therefore, strengthening their overall condition and enhancing their mental activity through special physical exercises is one of the most pressing issue.*

Keywords: *physical, mental, and psychological health, exercise, coordination, physical qualities, movement phases, pedagogical control.*

Introduction: The beginning of primary school age is marked by the child's entry into school. The early stage of school life typically spans the ages of 6-7 to 10-11 years (grades 1-4). This period is associated with increased physical and emotional stress, the expansion of the child's social boundaries, and their adaptation to society. During this time, the child reassesses themselves and their abilities, experiences another crisis, and learns to become an independent and responsible individual. At the primary school age, children have significant reserves for development. In primary school students, mental and physical preparedness develops rapidly. Physical qualities such as speed, agility, and flexibility are especially prominent during this period, as several physical traits begin to develop at a steady pace during primary school age. For girls aged 13-14, it is recommended to apply age-appropriate special exercises to enhance speed and agility.

Main Section:

Psychophysiological Characteristics of Primary School Students

Children aged 10–15 years are in a period of active growth, during which their bodies tire easily. However, during this age, reflex responses develop rapidly, and the ability to concentrate improves. Through special exercises, this process can be effectively managed.

The Effect of Physical Exercises on Mental Activity

Scientific research has shown that students with high levels of physical activity exhibit:

- Improved concentration abilities;
- Strengthened short-term memory;
- Increased inclination for creative thinking;
- Enhanced resistance to stress.

For instance, morning gymnastics, "exercise through play," active breaks, and coordination exercises improve blood circulation to the brain, activating cognitive functions.

Exercises for Primary School Students:

Below are exercises that may be effective for primary school students:

1. **"Aql bilan harakat" (Move with the Mind) Exercises** – These involve expressing answers to mathematical problems through physical movement. For example, while solving a math problem, the student may perform specific movements such as jumping or stepping based on the answer.
2. **Coordination Games** – Activities like the "left hand, right foot" exercises, which help harmonize the activity of the two hemispheres of the brain. These exercises develop coordination between different body parts and promote balanced physical development.
3. **Concentration Exercises** – Games like "quick response" challenge students to improve reflexes and focus their attention. These exercises train both mental agility and physical responsiveness.

Test Procedures for Assessing Physical and Mental Preparedness

Before determining the physical and mental preparedness of primary school students, it's essential to first learn how to conduct proper testing. These assessments help evaluate the overall physical and mental readiness of the students.

Specialists agree that the reliability of tests can be improved in various ways:

- Standardizing the testing procedures more rigorously;
- Increasing the number of participants in the testing process;
- Adding more evaluators (judges, experts) to ensure consistent results;
- Ensuring the alignment of evaluators' feedback and judgments;
- Increasing the number of equivalent tests to obtain more comprehensive data.

There are no universal fixed values for reliability indicators of tests, but these strategies help ensure that the tests are accurate and reliable.

In most cases, the following recommendations are used:

- 0.95–0.99 – excellent reliability;
- 0.90–0.94 – good;
- 0.80–0.89 – acceptable;
- 0.70–0.79 – poor;
- 0.60–0.69 – questionable for individual assessment, the test is only useful for describing the test group.

To increase the objectivity of physical fitness testing, the necessary conditions for conducting tests are as follows:

I. Standard requirements to increase the objectivity of testing:

1. Test time, location, and weather conditions.
2. Providing informational materials (clearly and illustratively explaining the test tasks).
3. Consistent measurement tools and technical devices.
4. Psychophysiological adjustments.

This addresses the objectivity of the test, but it also refers to the interpretability of the results. This is related to the level of independent interpretation of test results by different examiners.

In general, specialists agree that the reliability of tests can be improved through various means:

- Making the testing process more standardized;
- Increasing the number of participants (test subjects);
- Increasing the number of supervisors (observers);
- Increasing the number of equivalent tests.

When assessing the level of development of physical qualities or skills during testing, a pedagogical approach is used. This is a direct continuation of testing in sports. A pure pedagogical approach to testing can be exemplified by...

Tests such as **"Alpomish"** and **"Barchinoy"**, as well as many other test sets, can be mentioned. The variety of pedagogical tests seems limitless, because in reality, any exercise performed according to a specific algorithm, provided that clear conditions for its execution are defined, can be considered a test.

However, not all exercises meet the strict requirements for tests, which narrows down the range of exercises that can serve to objectively assess movement capabilities. Among the most commonly used test exercises in recent times, the following should be recognized:

- Running a 30 or 100-meter distance from a high start;
- The maximum number of pull-ups;
- Bending the body forward;
- 3x10-meter zigzag running;
- 6-minute running.

For children whose biological age exceeds their chronological age, muscle (42.5%) and digestive (37.3%) types of body structure are characteristic. According to the analysis of variance, the main factor causing variability in the discussed strength indicators in 5th-grade boys is their constitutional characteristics (see Table 2). The significance of this factor is clearly visible in the changes in hand dynamometer readings (26.6%).

Comparative Descriptions of Physical Fitness of Adolescents

Age	General Indicators	Constitution Type	Development Type
Chest	**Muscular**	**Asthenoid**	**Digestive**
Body Strength, kg			
13	60.73	54.81	76.25
14	78.85	75.80	91.50
Pull-ups on a bar, times			
13	5.74	5.45	10.14
14	7.03	7.10	12.92

The Criteria for Evaluating Strength Capabilities in 5th Grade Adolescents

The criteria for evaluating the development of strength capabilities in 5th-grade adolescents have been developed (see Table 3). In our opinion, a suitable approach to typological evaluation of strength capabilities is based on the constitutional characteristics in 13-year-old students and the degree of organism maturity in 14-year-old students. For students with a *torakal* body structure (13 years) and those with a normative developmental type (14 years), the generalized evaluation of these indicators is suitable. For students with a *retardant* type, it is advisable to shift the evaluation scale one point to the

left, and for those with an *accelerated* type, it is necessary to shift the scale one point to the right. This approach allows for the stratification of the strength evaluation scale for middle school students.

Based on the above, a pedagogical experiment was conducted, which focused on using special exercises to improve the physical fitness of 7th-grade boys in physical education lessons at general education schools.

In the pedagogical experiment, 7th-grade students participated. To conduct the experiment, (n=44) students were divided into two groups – experimental and control groups. The experimental group ("TG") underwent lessons based on the methodology developed and proposed by us. In the control group ("NG"), physical education lessons were conducted according to the standard school curriculum.

T/R	Physical exercises	TG (n = 22)	NG (n = 22)	t	r
		X±σ	X± σ		
1.	60m Running (Speed Ability) (sec)	9,37±0,12	9,43±0,11	1,73	>0,05
2	500m Running (Endurance Ability) (sec)	109,6±1,96	110,6±1,86	1,74	>0,05
3	Running and Long Jump (Speed-Strength Ability) (cm)	353,2±4,0	355,3±3,8	1,79	>0,05
4	Running and High Jump (Speed-Strength Ability) (cm)	103,7±2,52	102,3±2,47	1,86	>0,05
5.	Tennis Ball Throw (m)	31,2±1,22	30,57±1,15	1,76	>0,05
Gymnastics					
6	Number of Pull-ups on the Bar	4,2±0,38	4,41±0,36	1,88	>0,05
7	(strength ability) (times)				
8	Forward bending of the trunk,cm (flexibility)	5,22±0,23	5,09±0,22	1,92	>0,05
9	Body dynamometry (kg)	72,38±1,43	71,66±1,31	1,74	>0,05
10	Body dynamometry (kg)	24,3±0,97	23,8±0,87	1,80	>0,05

In the 60 m run, the average result for the experimental group was 9.37 seconds, while the control group had 9.42seconds. For the 500 m run, the experimental group achieved an average of 109.6 seconds, and the control group 110.1 seconds. In the long jump, the experimental group had an average result of 353.2 cm, while the control group achieved 355.3 cm. For the high jump, both groups had almost identical results, with the experimental group achieving 103.7 cm and the control group 102.3 cm. In tennis ball throwing, the experimental group recorded 31.2 meters, while the control group had 30.6 meters. Pull-ups on the bar resulted in an average of 4.2 times for the experimental group and 4.4 times for the control group. The dynamic hand strength for the experimental group was 24.3 kg, while the control group had 24.8 kg. Similar indicators were observed for the bench dynamometer, where the experimental group had 72.3 kg and the control group 71.7 kg. For the flexibility exercises, both groups showed similar results with an average of 5.2 cm for the experimental group and 5.1 cm for the control group.

According to the results of these control tests, there was no statistically significant difference between the experimental and control groups ($r > 0.05$).

Thus, the results of the control tests indicate that both the experimental and control group students had initial data regarding their physical readiness before the pedagogical experiment.

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