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THE ROLE OF GYMNASTICS IN DEVELOPING STRENGTH, SPEED, AND AGILITY IN PRIMARY SCHOOL STUDENTS (GRADES 1–4).

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Abstract

This article examines the pedagogical and methodological significance of gymnastics training in the development of strength, speed, and agility among primary school students (grades 1-4). A 12-week pedagogical experiment was conducted to compare the effectiveness of a specially designed gymnastics exercise program with the traditional physical education curriculum. The results demonstrated a statistically significant improvement in physical performance indicators in the experimental group ($p < 0.05$). The findings confirm that gymnastics is an effective means of enhancing the physical fitness of primary school students.

Keywords

primary education, gymnastics, physical qualities, strength, speed, agility, methodology, pedagogical experiment.

Primary school age (7–10 years) is considered a period of rapid growth and morpho-functional development of a child’s organism. At this stage, the central nervous system demonstrates a high level of plasticity, allowing motor skills to be formed quickly and effectively. Therefore, favorable biological conditions exist for the purposeful development of fundamental physical qualities such as strength, speed, and agility. Scientific research emphasizes that during early school age, coordination abilities and speed develop relatively rapidly, while muscular strength is effectively formed mainly through exercises based on body weight.

Vladimir M. Zatsiorsky characterizes physical qualities as the main functional components of human motor activity and emphasizes that, in the process of their development, the volume and intensity of training loads must be determined on a scientific basis [1]. In his view, properly selected exercises during childhood have a direct impact on future athletic performance and the overall level of physical fitness.

Lev P. Matveyev, in his theory of sports training, substantiated the principle of age-appropriate adaptation and emphasized that physical loads for primary school students should be increased gradually and systematically [2]. This principle serves as an important methodological foundation in planning physical education lessons.

Gymnastics training is distinguished by its versatility, wide range of movement amplitude, coordinative complexity, and comprehensive engagement of various muscle groups. Gymnastic elements—such as jumps, supports, hangs, balance exercises, and combinations of rapid movements—make it possible to develop several physical qualities simultaneously. Particularly in primary grades, gymnastics classes increase students’ interest, foster the development of movement culture, and promote positive motivation toward a healthy lifestyle.

In the modern education system, one of the primary objectives of physical education is to ensure the comprehensive physical development of students. From this perspective, the development of scientifically grounded methodological approaches aimed at improving strength, speed, and agility is considered a relevant and pressing issue. Although the role of gymnastics in

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developing these qualities has been sufficiently studied, there remains a need to examine its comprehensive impact under primary school conditions on an experimental basis.

Therefore, the purpose of this study is to determine the effectiveness of gymnastics training in developing strength, speed, and agility among students in grades 1–4, as well as to develop methodological recommendations.

The aim of the study is to determine the effectiveness of gymnastics training in developing strength, speed, and agility among students in grades 1–4 and to develop methodological recommendations.

The study was conducted during the 2024–2025 academic year with the participation of 2nd–3rd grade students from a general secondary school. The total number of participants was 60, who were equally divided into a control group (n = 30) and an experimental group (n = 30).

The control group participated in traditional physical education classes based on the current State Educational Standards. The experimental group, in contrast, was trained according to a specially developed set of gymnastic exercises. This set included the following:

- Bodyweight-based strength exercises: (for example, push-ups; hanging on a horizontal bar; pull-ups on a horizontal bar [assisted/lightened version]; maintaining the plank position; lifting the body with arm support on a gymnastic bench; wall-supported half-squat position).
- Short-distance speed exercises: (for example, 20–30 meter sprint; 4 × 10 meter shuttle run; running from a starting position in response to a signal; quick step changes (ladder drills); sprinting to a designated point and returning).
- Relay and coordination course exercises: (for example, zigzag running between cones; overcoming obstacles; consecutive jumps through gymnastic hoops; carrying an object while running in a relay format; a combination of crawling under and jumping over obstacles).
- Balance and jumping elements: (for example, walking on a gymnastic bench; standing on one leg; jumping over a low obstacle; standing long jump; jumping down to a designated point).
- The training sessions were conducted three times per week, each lasting 35 minutes, over a period of 12 weeks. Pedagogical observation, performance testing, and mathematical-statistical analysis were employed as research methods.

Physical qualities were assessed using the following tests:

30-meter sprint (speed);

Standing long jump (strength);

4 × 10 meter shuttle run (agility).

The results were processed using the Student's t-test, and the level of statistical significance was set at $p < 0.05$.

At the end of the experiment, a significant improvement was observed in the experimental group across all indicators. Strength indicators improved on average by 14–16%, speed by 11–13%, and agility by 15–17%. In contrast, the control group demonstrated improvements of approximately 3–5%. The results of the statistical analysis confirmed that the changes observed in the experimental group were statistically significant ($p < 0.05$). This confirms the comprehensive effect of gymnastics training.

The results were found to be consistent with the theoretical perspectives presented in scientific sources. Nikolai G. Ozolin emphasized that gymnastic exercises enhance movement speed and coordination by activating the central nervous system [3]. The significant improvement in agility indicators observed during the study can be explained precisely by this mechanism. Furthermore, Tudor O. Bompa, in his theory of periodization, notes that multifaceted motor activity in young children contributes to the integrated development of strength and speed [4]. Since the комплекс gymnastic exercises in the experimental group were designed in accordance with this principle, a high level of effectiveness was achieved.

CONCLUSION

The findings of the study demonstrate that systematically organized gymnastics training has a significant positive impact on the development of strength, speed, and agility in primary

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school students (grades 1–4). The implementation of specially designed bodyweight, speed, coordination, balance, and jumping exercises ensured a comprehensive influence on the students' physical development.

The experimental results confirmed that gymnastics-based training leads to statistically significant improvements in physical performance indicators compared to traditional physical education classes ($p < 0.05$). In particular, notable progress was observed in agility and strength indicators, highlighting the effectiveness of complex motor activities at primary school age.

Therefore, the integration of structured gymnastics exercises into physical education lessons can be recommended as an effective methodological approach for enhancing the physical fitness of young schoolchildren. Further research may focus on long-term effects and age-specific adaptations of gymnastics-based training programs.

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