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THE ROLE OF GYMNASTICS IN THE PHYSICAL DEVELOPMENT OF SCHOOL-AGE GIRLS

Khursanova Rukhsora Olimjon qizi

Oriental University

Senior Lecturer, Department of Physical Culture

Nasrullayeva Sevara Toshpulat qizi

Oriental University

1st-year student, Physical Culture program

Abstract. This article analyzes the role of gymnastic exercises in improving the physical development of school-age girls. In particular, it addresses the development of balance, flexibility, coordination, general agility, and posture through gymnastics-based means. The study involved 100 girls in grades 5–7, and the results showed higher indicators in the experimental group compared to the control group. The article also presents a sample weekly program for organizing gymnastics sessions in a school setting, methodological recommendations, and directions for further research.

Keywords: school-age girls, gymnastics, physical development, flexibility, balance, posture, coordination ability, rhythmic gymnastics, acrobatics

Introduction. Raising a healthy and well-rounded younger generation is one of the essential conditions for the development of society. The harmonious physical development of school-age girls, the formation of correct posture, and the improvement of movement coordination are of great importance for their future lives, including their readiness to fulfill the role of motherhood.

According to World Health Organization recommendations, school-age children should engage in at least 60 minutes of moderate-to-vigorous physical activity daily. However, practice shows that girls find it considerably more difficult to meet this recommendation than boys. This is influenced by socio-cultural factors, the fact that physical education classes are often adapted to boys' activity patterns, and girls' reluctance to perform certain exercises.

In recent years, a decline in the physical activity of schoolgirls, together with an increased academic workload and a more sedentary lifestyle, has led to problems such as postural disorders and declining flexibility and balance indicators. Prolonged sitting in front of computers and mobile devices has made postural defects such as scoliosis and kyphosis increasingly common among young people, further heightening the medical and social significance of the problem.

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Under these circumstances, gymnastics is of particular importance, as by its very nature it is a safe and universal means suited to the anatomical and physiological characteristics of the female organism. Gymnastic exercises develop not only physical qualities but also aesthetic sensibility, plasticity, and body awareness, all of which carry significant psychological value specifically for girls.

The purpose of this article is to experimentally substantiate the effectiveness of gymnastic exercises in the physical development of school-age girls and to develop methodological recommendations for their practical application.

Literature Review. An analysis of scientific research in pedagogy and physical education shows that traditional physical education classes mainly emphasize strength and speed qualities, without sufficiently developing flexibility, balance, and coordination — qualities of particular importance for girls.

A systematic review conducted by foreign scholars S. Brown and M. Lee (2022) demonstrated that gymnastics-based training programs significantly improve students' overall physical fitness. A study by J. Smith (2023) specifically highlighted the role of gymnastic exercises in developing movement coordination and balance ability in adolescent girls. K. Muller and H. Fischer (2021), in a study conducted in European schools, examined the effect of rhythmic gymnastics elements on flexibility and coordination, finding significant positive changes after a 12-week program.

A meta-analysis by R. Johnson and T. Clark (2022) summarized dozens of studies conducted in various countries on developing balance and coordination in young people, finding that gymnastics-based exercises are more effective in developing these qualities than other types of exercise.

Among scholars from CIS countries, E. Ivanova and A. Petrov (2020) studied the importance of rhythmic gymnastics in shaping plasticity and aesthetic movement skills in girls. N. Petrova (2023) put forward the idea of organizing physical education classes on the basis of a differentiated approach, emphasizing that each student's individual characteristics should be taken into account.

Uzbek researchers D. Karimova (2021), B. Yusupov (2022), and N. Rahimova (2023) developed methodological recommendations for applying gymnastics-based means in school settings. Sh. Xolmatova (2021) studied the pedagogical conditions for forming correct posture in girls, while G'. Nazarova (2023) analyzed the effectiveness of an individual approach in gymnastics lessons. F. Egamova (2022) produced an in-depth monographic study of the motor development characteristics of primary- and middle-school-age girls, and D. Umarova (2024) experimentally substantiated the effect of acrobatic exercises on students' physical qualities.

Nevertheless, the literature reviewed shows that studies specifically targeting school-age girls that combine various directions of gymnastics (general developmental, rhythmic, acrobatic, and balance exercises) into a single complex program, while jointly examining their effect on both physical and motivational indicators, remain insufficient. This underscores the continuing scientific and practical relevance of the topic.

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Research Methodology. The study was conducted during the 2025–2026 academic year and involved 100 girls in grades 5–7 of a general secondary school. Participants belonged to the primary medical group and were not exempt from physical education classes. The students were divided into two groups:

- Control group (n=50) – classes were conducted according to the traditional program;

- Experimental group (n=50) – a complex of gymnastic exercises was systematically incorporated into classes.

The following research methods were used:

- pedagogical observation;

- tests: single-leg balance test (using a stopwatch), sit-and-reach test (flexibility, cm), rotational movement test (coordination, points), a 10-point posture assessment scale, and a general agility test;

- a questionnaire survey (a 20-item questionnaire to determine the level of interest in classes);

- a pedagogical experiment (conducted over a period of 5 months);

- mathematical-statistical analysis (Student's t-test, with a significance level of $p<0.05$).

Each test was administered at the beginning and end of the experiment under identical conditions, at the same time of day (morning hours), and by the same specialists, which ensured the reliability of the results. Attendance rates and changes in the students' health were also monitored throughout the study.

The gymnastics-based directions applied in the experimental group were as follows:

- General developmental gymnastic exercises – a set of exercises aimed at making the body more flexible and mobile;

- Rhythmic gymnastics elements – plastic, harmonious movements performed to music;

- Balance exercises – exercises performed on a gymnastic bench and along a marked line;

- Acrobatic elements – simplified gymnastic elements such as forward rolls, bridges, and splits;

- Posture-forming exercises – exercises performed while walking along a wall or holding an object on the head.

A sample of the weekly gymnastics program applied in the experimental group is presented below.

Table 1.

Weekly gymnastics program used in the experimental group

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Day of the week	Focus	Duration	Main exercises
Monday	General developmental gymnastics	10 minutes	A complex of movements for the arms, legs and trunk
Wednesday	Rhythmic gymnastics	12 minutes	A complex of plastic movements performed to music
Friday	Balance and acrobatics	15 minutes	Walking on a gymnastic bench, forward rolls, bridge and split elements

Main Part. During the study, the girls' physical fitness and their interest in gymnastics sessions were examined. The initial test results in both groups were almost identical, and the difference was not statistically significant ($p>0.05$), confirming that the two groups had equivalent starting conditions and that the experimental results are reliable.

At the end of the 5-month experiment, the following results were recorded:

- Balance: the average result in the experimental group improved by 6.8 seconds, compared with only 1.6 seconds in the control group.

- Flexibility: the experimental group showed an increase of 5.5 cm, compared with 2 cm in the control group.

- Coordination: the experimental group improved by 2.7 points, compared with 0.7 points in the control group.

- Posture indicator: the experimental group improved by 2.6 points, compared with 0.5 points in the control group.

- General agility: the experimental group improved by 2.2 points, compared with 0.5 points in the control group.

- Interest in classes: in the experimental group, interest increased from 45% to 81%, whereas in the control group it rose from 46% to 53%.

An analysis by age group showed that the improvement in flexibility and balance indicators was somewhat higher among fifth-grade students than among seventh-grade students, suggesting that the body's adaptability to gymnastic exercises is greater at a younger age. At the same time, the improvement in posture indicators among seventh-grade students was more stable and pronounced.

A comparative analysis of the main results is presented below.

Table 2.

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Results at the beginning and end of the experiment (mean values)

Indicators	Control group (Pre-test)	Control group (Post-test)	Experimental group (Pre-test)	Experimental group (Post-test)
Balance test (sec)	14.2	15.8	14.5	21.3
Flexibility (sit-and-reach, cm)	7	9	7.5	13
Coordination (rotational movement test, points)	6.1	6.8	6.0	8.7
Posture indicator (points, 10-point scale)	6.4	6.9	6.3	8.9
General agility test (points)	5.8	6.3	5.9	8.1
Interest in classes (%)	46%	53%	45%	81%

The results of the statistical analysis confirmed that the experimental group's indicators were significantly higher than those of the control group across all measures ($p<0.05$). The largest differences were recorded in interest in classes and balance indicators, demonstrating that gymnastics is highly effective not only physically but also motivationally.

In addition. interest in gymnastics sessions increased considerably among the participants of the experimental group. Girls began performing exercises independently at home, observing their own movements in a mirror or on video, and making corrections on their own initiative. Some students organized small demonstration sessions in class, attempting to teach the gymnastic elements they had mastered to their classmates, which strengthened a sense of teamwork and mutual support.

Results and Discussion. The results of the experiment showed that gymnastic exercises, particularly rhythmic gymnastics and balance exercises, are considerably more effective than traditional exercises in developing schoolgirls' flexibility and coordination abilities. This is because the structure of gymnastic exercises corresponds to girls' natural inclination toward plasticity and their innate interest in aesthetic movement.

These findings are consistent with the results obtained by foreign researchers K. Muller and H. Fischer (2021), as well as R. Johnson and T. Clark (2022), whose work likewise showed gymnastics-based exercises to be highly effective in developing balance and coordination. This further confirms the reliability of the present findings and indicates that gymnastics is a universally effective means, regardless of cultural context.

Acrobatic and balance elements boosted the girls' self-confidence, as they gradually mastered exercises they had previously been unable to perform. Rhythmic gymnastics elements performed to music created a positive emotional atmosphere in class and also improved students' attendance rates. Pedagogical observations showed

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that absenteeism among students in the experimental group decreased by 30% compared with the control group.

The systematic application of posture-forming exercises led to a marked improvement in the postural condition of the majority of girls in the experimental group, which may have a positive long-term effect on their overall health, including the function of the spinal and neck-shoulder musculature. Supplementary medical examinations found that in 12 students of the experimental group, early-stage postural defects were noticeably reduced.

An interesting observation was recorded at the end of the study: of the 50 girls in the experimental group, 41 (82%) had made it a habit to perform gymnastic exercises independently outside of class at least 2–3 times a week. In addition, 18 students expressed interest in enrolling in gymnastics or choreography clubs outside of school, indicating the long-term positive impact of the study.

The study has certain limitations. In particular, it was conducted at only one general secondary school over a relatively short period of five months. Furthermore, the degree of parental support for gymnastic exercises at home was not separately examined, which may be an important direction for future research.

Conclusion. Based on the research conducted, the following conclusions were drawn:

- Traditional physical education classes are not sufficiently effective in promoting the physical development of school-age girls; therefore, the systematic introduction of gymnastics-based means is highly relevant.

- Gymnastic exercises, including rhythmic gymnastics, balance exercises, and acrobatic elements, enable more than a twofold faster improvement in girls' flexibility, balance, and coordination abilities.

- Gymnastics sessions have a positive effect on the correct formation of posture and serve as an important means of preventing postural disorders.

- A gymnastics-based approach significantly increases schoolgirls' interest and motivation toward classes (from 45% to 81%) and also improves class-attendance discipline.

- Such an approach helps sustain physical activity not only during class but also outside of school hours, and encourages students to take up sports and choreography.

- Differences exist between age groups: flexibility and balance develop faster in younger students, while posture indicators are more stable in older students — indicating the need to adapt gymnastics programs to age-specific characteristics.

The following practical recommendations were developed:

- Incorporate a dedicated complex of gymnastic exercises for girls into the physical education curriculum of general secondary schools;

- Organize an 8–10 minute block of rhythmic or general developmental gymnastics at the start of each lesson;

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- Introduce dedicated training blocks including balance and acrobatic elements at least 2–3 times a week (based on the sample program presented in Table 1);

- Conduct a special medical-pedagogical examination at least twice per academic year to monitor and correct posture;

- Equip schools with simplified equipment for developing balance and coordination (gymnastic benches, balance boards, gymnastic mats);

- Organize professional development courses on gymnastics methodology for physical education teachers;

- Organize school-wide gymnastics competitions among girls and reward active participants;

- Distribute methodological guides on simplified gymnastic exercises that can be performed at home in cooperation with parents.

Conducting broader-scale, longer-term studies (lasting at least one full academic year) involving girls from different regions and age groups, as well as examining the effect of gymnastics on other physical qualities (strength, endurance, speed) and on students' psychological state and self-esteem, may be considered a promising direction for future research. In addition, developing family-oriented formats of gymnastics programs that increase parental involvement remains a relevant topic for further study.

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