Developing coordination abilities in 5-6 year old children through gymnastics

Allambergenova Raushana Duisenbay kizi[1]

[1]Nukus state pedagogical institute named after Ajiniyaz, Nukus city, Karakalpakstan

Abstract

Purpose: To form and develop coordination abilities, enhance overall motor culture, and improve physical fitness levels in 5-6 year old children through the use of gymnastic exercises and equipment.

Methods: Theoretical analysis - studying scientific literature, pedagogical and methodological sources on the topic. Observation - monitoring children's activities during gymnastics sessions. Pedagogical experiment - implementing a specialized training program and determining its effectiveness. Test trials - standard tests for measuring coordination abilities (e.g., balance maintenance, running with directional changes, obstacle navigation). Statistical analysis - processing experimental results and drawing scientific conclusions.

Results: The study found that children's movement coordination through special exercises was initially about 50%, but by the end of the sessions, this indicator increased to 60-65%. The results were particularly high when exercises were performed at varying speeds, directions, and rhythms. The table below presents the developed set of exercises for improving the coordination of hand and foot movements in children. This exercise set is based on children's age characteristics, level of psychomotor development, natural forms of motor activity, as well as principles of effective use of gymnastic equipment.

Conlcusion: Exercises organized using gymnastic means significantly developed coordination abilities in 5-6 year old children, increased the level of conscious execution of movements, improved balance maintenance, and reduced coordination errors. The combination of hand and foot movements strengthened both gross and fine motor skills, creating a physiological foundation for subsequent stages of children's development, such as writing, drawing, participating in sports games, and playing music. The results of the pedagogical experiment demonstrated statistically significant positive changes.

Keywords: gymnastic equipment, coordination abilities, 5-6 year old children, physical development, motor activity, sports pedagogy, children's physical education, motor skills.

Introduction

The development of coordination abilities in 5-6 year old children is considered one of the priority directions of physical development. In many motor activities, it is precisely the level of development of these abilities that determines children's motor success. Coordination abilities play a particularly important role in skills such as performing movements quickly and accurately, maintaining balance, and correctly assessing space and time [5]. In developing these abilities, the formation of special coordination endurance through repeated and systematic application of gymnastic exercises significantly increases the effectiveness of training sessions.

The development of coordination abilities in 5-6 year old children is of particular importance, as it helps children perform complex movements in a stable and consistent manner. Specifically, skills such as quick decision-making during movement, determining spatial orientation, and executing balanced movements are directly related to the level of development of coordination abilities [4]. Analysis of scientific literature shows that experimentally testing methodologies for developing coordination abilities, as well as using control tests in this regard, is of great importance. Comprehensive development of children's physical and functional capabilities is achieved by correctly determining the volume of load, complexity, and rest regimes at different stages of training [3].

The statistical characteristics of the initial results measuring the development of balance ability in children at the beginning of the experiment were as follows. In the Romberg test for maintaining static balance on one leg, the experimental group showed ±б = 5.0±1.7 s (V= 33.9%), for the time of maintaining balance on one leg with eyes closed ±б = 4.0±1.4 s (V=34.7%), for the time of maintaining balance on two legs with eyes closed ±б = 14.0±2.9 s (V= 21.0%), for the straight-line walking test ±б = 3.1±0.8 (V=25.9%), and for the test time of zigzag running + ball throwing ±б = 12.9±0.9 s (V=7.1%).

A systematic sequence of special exercises using gymnastic methods has been developed to cultivate certain coordination abilities in 5-6-year-old children. These exercises help children move agilely and

Table 1. Comparative analysis of test results determining the effectiveness of maintaining balance and performing complex exercises in the experimental and control groups at the beginning of the experiment (n=30)

No.	Indicators	Experimental group		Control group		t	p
		$\overline{X}$ ±б	V%	$\overline{X}$ ±б	V%		
1	Romberg test: static balance test on one leg (seconds)	5.0±1.7	33.9	4.8±1.5	32.0	0.8	>0.05
2	Romberg test: balancing on one leg with eyes closed (seconds)	4.0±1.4	34.7	3.9±1.0	28.0	0.3	>0.05
3	Romberg test: balancing on both legs with eyes closed (seconds)	14.0±2.9	21.0	13.8±2.8	20.3	0.6	>0.05
4	Walking in a straight line (3 meters) (number of errors)	3.1±0.8	25.9	2.8±0.9	33.0	1.2	>0.05
5	"Zigzag Run + Ball Throw" (time taken)	12.9±0.9	7.1	12.6±0.8	7.0	1.3	>0.05

confidently, and are considered one of the main tasks in forming correct posture. They focus on improving abilities such as movement coordination, reaction speed, balance maintenance, rhythm perception, and spatial control of movement. Coordination exercises for 5-6-year-old children enhance body awareness and spatial movement. This is crucial not only in sports but also in daily life. A person with well-developed coordination can better maintain balance even in challenging situations, reducing the risk of injury. Therefore, it is essential to form and improve coordination abilities.

The following forms of physical education activities were used in the physical education system to develop coordination abilities of older preschool children: physical education classes; health-improving activities throughout the day, and morning hygienic gymnastics sessions. These include physical exercises and active games during morning exercises, a daily set of physical and health-improving exercises, physical education and mass sports events in preschool educational institutions, monthly health days, and various outdoor walks aimed at improving health.

All the aforementioned forms and types of health-improving functions of physical education require the creation of necessary conditions for implementing a complex of special physical exercises to increase the motor activity of preschool-aged children and develop their motor and coordination abilities. We can achieve our goal only by comprehensively applying all forms of physical education activities for the purposeful development of motor and coordination abilities.

The main form of physical education in developing coordination abilities is the physical education lesson in preschool educational institutions. The duration of the lesson for developing the ability to maintain balance, which is one type of coordination ability, was 30 minutes for the pupils. Each training session was purposeful and had to meet specific pedagogical tasks. Taking these into account, the content of the lesson, the choice of teaching means and methods, and the approaches to organizing the motor activities of the pupils were determined.

The means, forms, and methods of physical education in the process of lessons aimed at developing coordination abilities were selected taking into account the age-related and individual characteristics of children's physical development and functional readiness. Physical exercises with limited volume and intensity were used in physical education classes.

When determining the norms of workload in the training process, we based our approach on the medical and pedagogical characteristics of the children, their physical and individual preparedness. A methodology for developing coordination abilities was created, taking into account the physical and mental capabilities of the pupils. The volume of physical exercises was selected based on the children's functional capabilities.

To develop motor skills in older

preschool children and prepare their bodies for physical exertion, we divided the training sessions into preparatory and main periods. As a result, this allowed us to gradually increase both the requirements for pupils during the educational process and the volume of exercises performed simultaneously. Each stage of the training process had its own task, goal, direction, workload, and duration.

In our study, the preparatory stage of training (lasting 1.5-2 months) encompassed the entire first quarter of the academic year. During this stage, the primary focus was on gradually acclimating the children to physical exertion, developing proper posture, and teaching them to maintain consistent breathing while performing static and dynamic exercises aimed at improving balance. In the preparatory stage, the motor density of physical education sessions constituted 50-55% of the total class duration. This proportion proved particularly optimal for activities designed to enhance the coordination abilities of 5-6-year-old children through gymnastics, aligning with their physiological capabilities and effectively stimulating motor activity. Adequate organization of motor activity is a crucial factor in developing coordination abilities, particularly in aspects such as maintaining balance, controlling movements, and quickly adapting.

The main stage of our research spanned 8 -9 months, covering an entire academic year. The primary objectives of this stage were to gradually increase the children's level of physical fitness, develop and refine their coordination abilities, and monitor their acquisition of motor skills and proficiencies from the range of physical exercises outlined in the preschool education program.

If the motor density of physical education classes in preschool educational institutions was 60-65%, then by 8-9 months this indicator increased to 70-75% of the total class time.

In our study, during the main stage of education, great attention was paid to the formation and development of coordination abilities, including the ability to maintain balance, in children aged 5-6 years. For this purpose, in the process of physical education classes, based on the preschool curriculum for preschool children, special physical exercises were additionally implemented using gymnastic equipment.

The main means of developing and improving coordination abilities, including the balance function, in older preschool children were organized using exercises aimed at maintaining balance on a gymnastic bench, walking along a line, exercises using hoops (obrach), balls, exercises aimed at maintaining balance on a gymnastic ball (fitball), and exercises performed using various gymnastic equipment.

Results and discussion

Taking into account the children's varying levels of physical fitness and their tendency to tire quickly, we gradually increased the volume and intensity of exercises during the training, while limiting those that require maximum speed-strength and endurance as much as possible. In our training process, we did not use exercises that develop strength endurance, including prolonged static holds on sports equipment, forceful lifting, and stretching. Instead, the sessions incorporated more exercises performed with various gymnastic equipment, walking, running, active games, elements of sports games, and balance exercises combined with breathing exercises.

A set of exercises based on gymnastic equipment not only intensifies the motor responses of a child's body but also significantly increases the speed, accuracy, and coordination of movements performed together. This positively affects children's physical activity, interest in movement, and level of self-awareness. Each exercise is structured in a sequence, with the level of complexity gradually increasing, and encompasses qualities such as attention, quickness, reaction time, and coordination along with movement coordination.

Through the systematic and methodical application of these exercises, children aged 5-6 significantly develop coordination of movements, synchronization of limb movements, awareness of spatial directions, and conscious control of movement [1]. This, in turn, serves to increase the level of physical fitness and psychophysiological adaptation of children.

At the end of the exercises, an increase in the level of conscious execution of movements, a decrease in coordination errors, and an increase in the duration of movements were observed in children of preschool educational institutions. The combination of arm and leg movements creates a physiological foundation

Table 2. Complex of exercises using gymnastic tools for developing coordination abilities in older preschool children

No	Exercise name	Content	Duration	Methodological recommendations
1	Walking with balance on a bench	Starting position: walking with arms extended to the sides. Jump to the ground with feet together at the end of the bench.	10-15 seconds	Children are encouraged to perform the exercise quickly and accurately while maintaining balance
2	Jumping through hoops while holding a fitball	Jump through 5 hoops with both feet while holding a fitball with both hands	20-25 seconds	It is recommended not to drop the ball and to jump through the hoops without stepping on them
3	Jumping over barriers	Jump over 2 barriers on one foot	2 times	Accuracy is required when jumping over barriers. It is recommended not to touch or knock down the barriers
4	Dribbling a small ball on the ground	Run backwards to the designated point while dribbling the ball, then return, coordinating hands and feet	30-35 seconds	Active hand movement is required during the exercise to avoid dropping the ball

for skills such as writing, drawing, participating in sports games, playing musical instruments, and mastering complex types of movements, which are crucial for the next stage of a child's development [2]. From this perspective, the use of a set of exercises structured with gymnastic techniques is recommended as an effective pedagogical tool for strengthening children's coordination in general and fine motor skills, body control, movement planning, sensory perception, and execution.

The statistical characteristics of the results measuring the development of balance ability in children at the end of the experiment were as follows. In the Romberg test for maintaining static balance on one leg, the experimental group showed ±Ϭ = 6.9±0.8 s (V= 11.9%). For maintaining balance on one leg with eyes closed, the result was ±Ϭ = 5.4±0.7 s (V=13.4%). For maintaining balance on two legs with eyes closed, it was ±Ϭ = 21.4±2.8 s (V= 13.3%). The straight-line walking test resulted in ±Ϭ = 2.0±0.5 (V= 25.2%), while the zigzag running + ball throwing test time was ±Ϭ = 12.1±0.9 s (V= 7.1%).

Table 3. Comparative analysis of test results determining the effectiveness of maintaining balance and performing complex exercises at the end of the experiment in the experimental and control groups (n=30)

No.	Indicators	Experimental group		Control group		t	p
		$\overline{X}$ ±σ	V%	$\overline{X}$ ±σ	V%		
1	Romberg test: static balance on one leg (seconds)	6.9±0.8	11.9	5.7±1.3	23.0	4.2	<0.001
2	One-legged balance test with eyes closed (Romberg)	5.4±0.7	13.4	4.3±0.7	16.4	4.6	<0.001
3	Two-legged balance test with eyes closed (Romberg)	21.4±2.8	13.3	19.3±2.2	11.6	5.0	<0.001
4	Walking along a straight line (3 meters)	2.0±0.5	25.2	2.5±0.7	30.6	2.2	<0.05
5	"Zigzag running + ball throwing" (time taken)	12.1±0.9	7.1	12.7±0.8	6.8	2.2	<0.05

Conclusion

The conducted analysis revealed that coordination abilities are not sufficiently developed in older preschool children, which causes them to encounter difficulties in performing exercises such as running and jumping. In particular, the poor combination of arm and leg movements negatively affects the accuracy, coordination, and rhythmic execution of their movements.

This leads to insufficient development of the basic coordination abilities that should be formed during the preschool age. Furthermore, considering the age-specific physical development characteristics, the need was identified for a thorough analysis of the complex and multifaceted structure of coordination abilities (balance, movement control, harmony of limb movements, fine motor precision, etc.) and their targeted development based on gymnastic means.

References

Kosheva M.S. **(2021).** *Features of the development of logical thinking in older preschool children // development and application of high-tech technologies in the interests of modernization of modern society.* - pp. 156 -161.

Lukyanchenko A.M., Dvorkina, N.I. **(2012).** *Diagnostics of the development of hand coordination abilities in gymnasts aged 5-6 years.* In Abstracts of the XXXX Scientific Conference of Students and Young Scientists of Universities of the Southern Federal District (pp. 97-97).

Pavlova A.N. **(2020).** *Modern Games of Modern Children // Student-Researcher.* Philin: Physical Education, Personality, Science. P. 319-322.

Penzulaeva L.I. **(2014).** *Physical Education in Kindergarten: A Manual for Classes with Children 5-6 Years Old (Senior Group)* / L.I. Penzulaeva. - Moscow: Mozaika-Sintez. - 128 p.

Trofimov O.N. **(2011).** *Development of Coordination Abilities and Balance in Primary School-Age Children* // Yaroslavl Pedagogical Bulletin. - Vol. 2. - No. 3. - P. 114 -118.

Vako, I., Kashuba, V., Khmelnitska, I., Radchenko, Y., Radchenko, A., Carp, I., & Krupenya, S. **(2024).** *Utilizing technology to develop fundamental motor skills in young athletes specializing in hand-to-hand combat.* Journal of Physical Education and Sport, Vol. 24 (issue 2), Art 36, pp. 303 – 312.

AUTHOR BIOGRAPHY:



Raushana Duisenbay kizi ALLAMBERGENOVA

Employment
Doctoral student at Nukus state pedagogical institute named after Ajiniyaz

Degree
MD

Research interests
gymnastics, physical education and sport, Theory of physical education, analyzing of sport competitions.