



ANALYSIS OF INDICATORS
OF PHYSICAL PREPAREDNESS
OF CHILDREN
OF SENIOR PRESCHOOL AGE

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Annotations

Preschool age is the most favorable period for the development of the child's personality, physical and motor qualities. One of the task of working with older preschool children is to prepare them for a successful transition to a systematic organized education. The readiness of children for school education determines the set of morphophysiological and psychological characteristics of older preschool children. Physical and motor preparedness of children for education characterizes the functional capabilities and the state of their health. One of the main indicators of physical and motor preparedness of children for education is the level of development of their physical qualities and technique of performing motor actions. **The aim** is to determine and analyze the level of physical preparedness of children of senior preschool age. **Material and methods:** analysis and general conclusion of scientific and methodical literature and Internet resources, pedagogical observation, pedagogical experiment, pedagogical testing, methods of mathematical statistics. The research was conducted on the basis of preschool educational institutions № 355 and №123. The research involved 80 children aged 5-6 years old, 40 of them were the control group and 40 of them were in the experimental group. **Research results.** The most of children, 76.5%, have an average level of physical preparedness. The best results of children in the experimental group were observed in the exercises "jumps on the spot", "jumps with a turn" to the right and left, "trunk bending", "hanging on the horizontal bar", "running" for 10 m, "standing long jump". The average level of the most of children in the control group was observed in the tests "jumps with a turn" to the right, "trunk bending", "hanging on the horizontal bar" and "standing long jump". This level of motor preparedness will not allow children to master the most of the vital motor skills at a sufficient level. This may be connected with the low level of physical activity of children during the day. Therefore, it is necessary to introduce the new health technologies into the physical culture and health work of preschool educational institution, which will be aimed at the mastering the new skills.

Key words: children aged 5-6 years old, senior preschool age, physical preparedness, motor preparedness, preschoolers.

Анотація

Дошкільний вік є найсприятливішим періодом для розвитку особистості дитини, фізичних і рухових якостей. Одним із завдань роботи з дітьми старшого дошкільного віку є підготовка їх до успішного переходу до систематичного організованого шкільного навчання. Готовність дітей до шкільного навчання визначає сукупність морфологічних і психологічних особливостей дітей старшого дошкільного віку. Фізична та рухова готовність дітей до навчання характеризує функціональні можливості і стан їхнього здоров'я. Одними з головних показників фізичної та рухової готовності дітей до навчання є: рівень розвитку фізичних якос-

тей і техніка виконання рухових дій. **Мета** – визначити та проаналізувати рівень фізичної підготовленості дітей старшого дошкільного віку. **Матеріал і методи:** аналіз та узагальнення науково-методичної літератури та Інтернет-ресурсів, педагогічне спостереження, педагогічний експеримент, педагогічне тестування, методи математичної статистики. Дослідження проводилось на базі закладу дошкільної освіти № 355 та №123. У дослідженні взяли участь 80 дітей. З них по 40 осіб склала контрольна та експериментальна група 5-6 років. **Результати досліджень.** Більшість дітей 76,5% мають середній рівень фізичної підготовленості. Кращі результати у дітей експериментальної групи спостерігалися у вправі «стрибки на місці», «стрибки з поворотом» вправо і вліво, «нахил», «вис на перекладині», «біг» на 10 м, «стрибок у довжину з місця». У контрольній групі у більшості дітей середній рівень спостерігався у тестах «стрибки з поворотом» вправо, «нахил», «вис на перекладині» та «стрибок у довжину з місця». Такий рівень рухової підготовленості не дозволить дітям опанувати на достатньому рівні більшістю життєво-необхідних рухових навиків. Це може бути пов'язано з малою руховою активністю дітей протягом дня. Тому необхідно впроваджувати у фізкультурно-оздоровчу роботу ЗДО нові оздоровчі технології, які будуть спрямовані на засвоєння нових навиків.

Ключові слова: діти 5-6 років, старший дошкільний вік, фізична підготовленість, рухова підготовленість, дошкільники.

Introduction. Preschool age is the period of the most intensive growth and development of the organism [11; 14]. The foundations of future health, the level of physical training and the basic personality traits are laid at this age. It is the most favorable period for the child's development, for the development of physical and motor qualities [17; 18]. One of the most important task of working with the older preschool children is to prepare them for a successful transition to a systematic organized school education, which is possible in the presence of a set of morphophysiological and psychological characteristics of children aged 5-6 years old of senior preschool age, which determines children's readiness for the school education [2; 12]. Physical preparedness for education characterizes the functionality and the state of health [1]. Health and efficiency of children largely depend on the development of motor function [3; 6; 11] and physical preparedness in particular. It is reflected in the implementation of basic vital motor skills - walking, running, jumping, throwing, swimming [4; 16].

The optimization of the system of preschool physical education in Ukraine requires new approaches to solving the main goal of physical education – it is the improving of children's health [13]. Nowadays,

rather intensive researches are held in the field of physical culture and sport on the introduction of various organizational and health technologies in the process of physical education in preschool education in particular [8; 15]. Therefore, the analysis and the evaluation of the main indicators of physical preparedness of preschool children was the aim of our study.

Aim. The aim is to determine the impact of the program on the level of physical preparedness of children aged 5-6 years old, which is necessary for the timely and rational use of means and methods of physical education in conducting physical culture and health classes in preschool educational institutions in Ukraine.

Material and methods.

Participants 80 children took part in the scientific research, who were divided into 2 groups: experimental and control groups of 40 children each. The division of children into groups was carried out taking into account the age characteristics of the studied contingent, the peculiarities of organization of the educational process and physical culture and health work of senior preschool children in the day of preschool education (Ukraine) (Table 1).

Organization of the study. The research was conducted in preschool educational institutions of

Dnipro (Ukraine) №355 "Dream" and №123 "Baby". The parents were informed before the testing their children and they agreed for testing children. All children who tested belonged to the main health group and they had no abnormalities in health.

Research procedure. To determine the physical preparedness of the older preschool children, we used the tests and their interpretation, which are recommended in the manual of Professor Vilchkovsky E.S. "Organization of the motor regime of children in preschool educational institutions: educational and methodical manual" [20]: speed - "walking 10 m "(s)," running 10 m on the move "(s)," jumps on the spot "for 5 s (times)," hand movements "for 5 s (times); agility - "jumps with a turn of the body to the right and to the left" (degrees); flexibility – "trunk bending forward from a standing position" (cm); speed and power qualities of the child - "standing long jump" (cm); strength endurance - "hanging on the pole" (c).

The pedagogical experiment was the introduction of a program for the formation of a culture of movements of children aged 5-6 years "Rhythmic Gymnastics for Preschoolers" (copyright certificate №99827 from September 22, 2020) and the assessment of its impact on the level of physical preparedness

of children aged 5-6 years old. The developed program [5] is designed for 9 months. Due to quarantine restrictions, the experiment lasted 6.5 months (from September 2019 till March 12, 2020).

The program "Rhythmic Gymnastics for Preschoolers" provides for the introduction of rhythmic gymnastics in the morning hygienic gymnastics and physical education.

The control of the level of physical preparedness was carried out in September 2019 - a confirmatory experiment and in March 2020 - a formative experiment.

Statistical analysis. The research used the calculation of the mean (\bar{x}), medium-statistical deviation (S), Student's criterion ($p < .05$, $p > .05$), percentage calculation, calculation of the increase in the results of the Brody index.

Results. At the beginning of the experiment, the indicators of physical preparedness of the control group in almost all tests were probably better than in the experimental group. The averages were higher in the experimental group only in the tests "jumps with turns" to the right and to the left. The significant difference between the results ($p < .05$) was observed in the tests of "hand movements" with the right and left hands, "jumps on the spot", "trunk bending", thus children of the control group performed these tests probably better (table 2).

The study found that most children in both the experimental and control groups before the experiment performed "hand movements" at a low level, both right and left

hands. Low levels were also observed in the experimental and control groups in exercises "hanging on the horizontal bar" and "dynamometry" with both right and left hands. 40.0% of children in the experimental and 35.0% of control groups performed the exercise "jumps on the spot" at the average level. Only children in the control group had a high level in this exercise. The test "jumps with turns" to the right 42.5% of children in the experimental group and 50.0% of children in the control groups performed at the average level. At a high level, 22.5% and 12.5% of children performed this test, accordingly.

Children of the experimental and control groups showed a medium level in the exercise "jumps with turns" to the left, only children in the experimental group showed a high level in this exercise.

We determined the development of flexibility by the trunk bending test. Thus, 45.0% of children in the experimental and 47.5% of children in the control groups had an average level of flexibility, and 7.5% and 17.5% of children had a high level of flexibility accordingly.

The results of indicators "walking 10 m" of children both in the experimental and control groups were at the average level, a high level was observed in 42.5% of children in the experimental group and in 35.0% of children in the control group. The indicators of the test "running 10 m" were at a low level both in the experimental and control groups. The average level was observed in the experimental group performing the

test "standing long jump", and the low level was observed in the control group of children. When walking and running, the children had such mistakes as: they did not maintain the correct posture, there were no vigorous footsteps and free hand movements, active bending of the legs at the knee joint. The distracted attention and the head rotation were observed, and they did not allow the child to concentrate on the exercise. They followed different directions quite well when walking and running. The analysis of the technique of performing standing long jump showed that the largest number of mistakes was observed during repulsion, flight and maintaining balance during landing. Therefore, we believe that the introduction of the program "Rhythmic Gymnastics for Preschoolers" will be an effective means of shaping the technique of the long jumps. So it contains a balanced set of means of rhythmic gymnastics, which will be aimed at the formation of the technique of performing vital motor skills and abilities of older preschool children. This level of motor preparedness will not allow children to master at a sufficient level the most of the vital motor skills. This may be connected with a low physical activity of children during the day. Therefore, it is necessary to introduce the new health technologies into the physical culture and health work of preschool educational institutions, which will be aimed at mastering of the new skills.

After the experiment, the indicators of physical preparedness of

Table 1

Distribution of children by the age groups

Sex	Children (n=80)							
	CG (n=40)				EG (n=40)			
	5 years	%	6 years	%	5 years	%	6 years	%
Girls	16	40.0	6	15.0	13	32.5	11	27.5
Boys	14	35.0	4	10.0	11	27.5	5	12.5
Total	30	75.0	10	25.0	24	60.0	16	40.0

Table 2

Indicators of physical preparedness of children of senior preschool age before the experiment

Test		Sex	Control group (n=40) $\bar{x} \pm S$	p < .05	Experimental group (n=40) $\bar{x} \pm S$
Hand movements for 5 sec., times	Right	BG	16.35±5.73	< .05	10.95±3.19
	Left		15.98±4.81	< .05	10.95±2.64
Jumps on the spot for 5 sec., times			12.95±4.03	< .05	10.53±2.33
Jumps with turns, degrees	Right		165.75±45.4	> .05	166.5±66.98
	Left		139.75±40.18	> .05	158.63±66.81
Trunk bending, cm			6.45±3.92	< .05	4.78±2.83
Dynamometry, kg	Right		5.65±1.77	> .05	5.21±1.56
	Left		5.69±1.64	> .05	5.03±1.60
Hanging on the horizontal bar, s			21.6±10.55	> .05	19.53±11.90
Walking 10 m, s			7.31±1.28	> .05	7.04±0.99
Running 10 m, s			4.01±0.87	< .05	3.50±0.43
Standing long jump, cm			70.18±15.31	> .05	75.08±12.23

children aged 5-6 years old in both groups improved and, the indicators of the most of children correspond to the average level. A significant difference ($p < .05$) between the experimental and control groups was observed in the exercises "hand movements" with the right and left hands, "jumps on the spot", "jumps with a turn" to the left, "trunk bending" (table 3). Children in the experimental group probably better ($p < .05$) performed the test "jumps with a turn" to the left (180.63 ± 53.75 degrees).

After the experiment, the children of the experimental group in the tests "jumps on the spot", "jumps with turns" to the right and to the left, "trunk bending", "running 10 m", "standing long jump" showed an average level. A high level was observed in the tests "jumps with turns" to the right and to the left, "hanging on the horizontal bar", "walking 10 m", "running 10 m" and "standing long jump".

The most of children in the control group showed a low level in the exercises "jumps with turns" to the left, "hanging on the horizontal bar" and "running 10 m". The average level was observed in the exercises

"jumps on the spot", "jumps with turns" to the right, "trunk bending", "hanging on the horizontal bar", "walking 10 m", "running 10 m" and "standing long jump". There was a high level in the tests "jumping on the spot", "trunk bending", "walking 10 m" and "standing long jump".

Therefore, we tested the children of the experimental and control groups to determine the initial level of physical preparedness of children at the beginning of the experiment. The received data showed that the initial level was not equal. The indicators were probably better in the control group than in the experimental group ($p < .05$). The percentage increase in all tests was higher in the experimental group than in the control group after the experiment. Thus, the largest percentage increase was in the tests "hand movements" right (15.44%, $p > 0.05$) and left (15.19%, $p > 0.05$), "jumps on the spot" (15.55%, $p > 0.05$), "trunk bending" (19.27%, $p > 0.05$), "hanging on the horizontal bar" (18.80%, $p > 0.05$), "running 10 m" (5.01%, $p > 0.05$), "standing long jump" (3.43%, $p > 0.05$) and a significant increase was in the

tests "jumps with a turn" to the right (15.94%, $p < 0.05$) and left (17.12%, $p < 0.05$) in the experimental group. The high percentage increase was in the tests "hand movements" right (10.32%, $p > 0.05$), "trunk bending" (14.18%, $p > 0.05$), "hanging on the crossbar" (16.69%, $p > 0.05$) in the control group.

Thus, the majority of children 76.5% have an average level of physical preparedness. The best results of the children in the experimental group were observed in the exercise "jumps on the spot", "jumps with a turn" to the right and to the left, "trunk bending", "hanging on the horizontal bar", "running 10 m", "standing long jump". The average level of the most of children in the control group was observed in the tests "jumps with a turn to the right", "trunk bending", "hanging on the horizontal bar" and "standing long jump". This level of physical preparedness will help to improve the health of children and will have a positive effect on learning new, more complex movements in future.

Discussion. The analysis of the practical results of the authors and their own researches [4] allows us

Table 3

Indicators of physical preparedness of children aged 5-6 years after the experiment

Test		Sex	Control group (n=40)	p < .05	Experimental group (n=40)
			$\bar{x} \pm S$		$\bar{x} \pm S$
Hand movements for 5 sec., times	Right	BG	17.93±5.38	< .05	13.38±5.43
	Left		17.30±4.46	< .05	13.35±5.06
Jumps on the spot for 5 sec., times			13.98±3.45	< .05	12.35±2.71
Jumps with turns, degrees	Right		172.00±38.58	> .05	187.13±50.05
	Left		144.63±38.00	< .05	180.63±53.75
Trunk bending, cm			6.95±3.58	< .05	5.45±2.62
Dynamometry, kg	Right		5.89±1.83	> .05	5.76±1.74
	Left		5.84±1.57	> .05	5.44±1.72
Hanging on the horizontal bar, s			25.05±10.04	> .05	23.23±11.94
Walking 10 m, s			7.07±0.64	> .05	6.83±0.92
Running 10 m, s			3.89±0.83	< .05	3.32±0.35
Standing long jump, cm			71.60±14.85	< .05	77.45±11.23

to assert that the most of children have an average level of physical preparedness, but the technique of performing the vital motor skills is a common problem among the preschool children. The low level of walking technique, running technique, jumping technique does not allow the child to reach a high level of the physical and motor preparedness and it is a problem for mastering more complex movements in future.

The data obtained by us through the experimental research, continued the research to determine the level of physical preparedness of children aged 5-6 years old and coordinate with the results of the authors Kuzmenko, & Chernysh, 2018 [10]. The authors analyzed the development of physical qualities of children aged 5-6 years old and found that the children aged 6 years old have the best results. The results of girls were better in the tests "trunk bending from a sitting position", and the results of boys were better in the tests "standing long jump", "throwing the ball at a distance" and "maintaining static balance". According to the results of testing, the authors determined that children have an average level of

physical preparedness. The research confirmed that a significant number of preschoolers, namely 76.5%, have an average level of physical preparedness.

A research by Ivashchenko (2017) [7], which studied the children of primary school age (6-10 years old) states that the girls show better results in the coordination movements connected with a combination of hand and foot movements and flexibility. While, the boys in this age group differ from the girls in the better development of general coordination of movements, strength, speed, strength and general endurance.

Our results coincide with the results of other authors [19], who conducted an experiment in a preschool educational institution in Japan with children aged 5 years old. They studied the children's motor skills and compared the results of boys and girls. The authors found out that the most of children of this age had an average level of motor skills (41.7%). Comparing the large motility of boys and girls, the research showed that the points for gallop and jumps, starting points, the sum of standard points of girls was high-

er than the sum of standard points of boys. The points for punches, kicks and throws, as well as the initial data for the control of the object of the boys were much higher than of the girls.

Thus, the implementation of the program "Rhythmic Gymnastics for Preschoolers" allows you to form the correct technique of performing the vital motor skills and to increase the level of physical preparedness of children aged 5-6 years old.

Conclusions. Our proposed program "Rhythmic Gymnastics for Preschoolers" has significantly affected the level of physical preparedness of the children in the experimental group. The results of the control group had a slight improvement compared with the experimental group.

Author contributions

All authors have participated in all parts of the research work and in the preparation of the article (Conception and design of the study, acquisition, analysis and interpretation of the data, revision of the content, and final approval of this document).

Supporting agencies

No funding agencies were re-

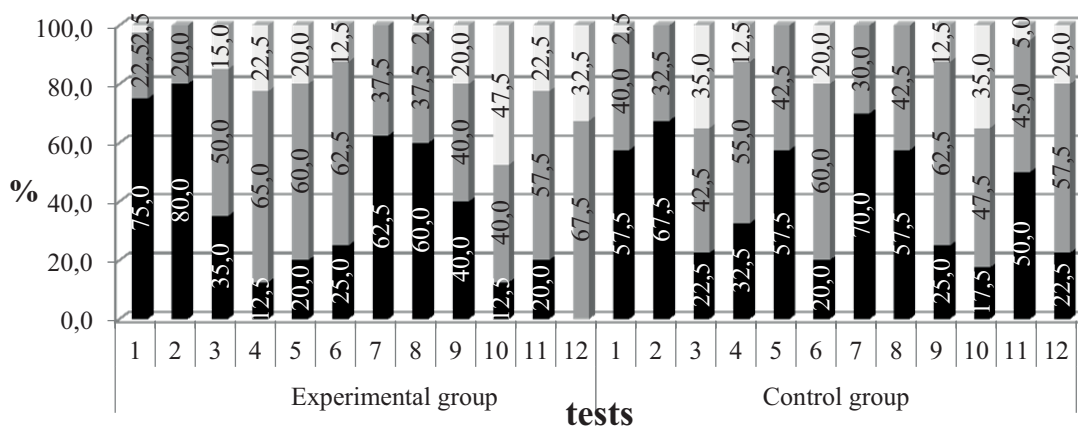


Figure 1. Distribution of children aged 5-6 years old by levels of physical preparedness after the experiment

Notes: 1-Hand movements, right hand; 2-Hand movements, left hand; 3-Jumps on the spot; 4-Jumps with a turn to the right; 5-Jumps with a turn to the left; 6-Trunk bending; 7-Dynamometry, right; 8-Dynamometry, left; 9-Hanging on the horizontal bar; 10-Walking 10 m; 11-Running 10 m; 12-Standing long jump.



ported by the authors.

Disclosure statement

The authors declare no conflicts of interest.

Prospects of further research

Based on these indicators of physical preparedness, it is planned to develop a physical culture and

health program for the formation of the culture of movements of children of the primary school age by means of rhythmic gymnastics.

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