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Game method application efficiency for speed and power capability development of trampoline athletes at the initial training stage

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Purpose: *to prove the effectiveness of using the game method for speed and power capability development of trampoline athletes at the initial training stage.*

Material & Methods: *in the article the materials of the research that was carried out with the help of pedagogical testing of trampoliners of 7–8 years on the basis of the Children and Youth Sports School No. 7, Trampoline Department of Kharkov.*

***Results*:** *conducted pedagogical experiment showed the effectiveness of the developed methodology for the development of speed-strength abilities of trampoline athletes at the initial training stage using the game method.*

***Conclusion*:** *results of the experiment confirm the importance of the use of the game method for the development of speed-strength abilities in the initial training of young trampolines, which further affects the level of their technical preparedness and the effectiveness of competition activities.*

Keywords: *game method*, *speed and power capability*, *trampoline athletes*, *initial training stage*, *testing.*

Introduction

In the current conditions for the training of young athletes, there is a need to develop and improve methods for the development of their physical qualities, especially at the stage of initial training, on which the fundamentals of the sport technique are laid, a variety of physical training is conducted and a steady interest in pursuing the chosen sport. The effectiveness of the training process is directly dependent on the funds used in the classes with athletes in accordance with the physiological characteristics of this age [7]. Children 7–8 years old are inclined to games, fantasies, imitations, and that is why the game method of teaching motor actions is especially productive in training sessions. According to a number of scientists [2; 4; 5; 11; 12], the game method helps with the study of the technique of movements, creates opportunities for the integrated development of motor skills and qualities, develops the ability to correctly assess the spatial and temporal characteristics, quickly and correctly react to the situation that develops under changing conditions of the game. Recently, outdoor games have become widely used as an effective tool in the training process in connection with the significant capabilities of the game method of training in sports training, as well as due to the early specialization of various sports [1]. This fact actualizes the use of the game method as a key aspect in the formation of a sustainable sporting interest, the development of physical qualities, namely, in improving the speed-strength abilities [2; 5; 12]. The development of speed-strength qualities in jumping on the trampoline is one of the main indicators of the physical preparedness of athletes, on the level of development of which, at the stage of initial training, the achievement of a further sporting outcome depends. In a number of studies [2; 11; 12], scientists note that the age of 7–8 years is the most significant for the growth of speed-strength abilities, which play an important role in the sports training of trampolines on the trampoline. The mechanical capabilities of the trampoline and the specificity of the sport, which involves the execution of a combination of 10 elements at the maximum flight altitude, requires the athlete to a high level of development of all physical qualities, and especially – speed and power at the stage of initial training [6; 7].

The purpose of the research

To prove the effectiveness of using the game method for speed and power capability development of trampoline athletes at the initial training stage.

Material and Methods of the research

The experiment, in which 14 sportsmen of 7–8 years took part, was held on the basis of the Children's and Youth Sports School No. 7, trampoline department of Kharkov. During the research at the beginning of the experiment, the speed-strength abilities of young trampoline athletes were tested and a methodology for their improvement was developed using the game method. The experimental method of developing the speed-strength abilities included the use in the preparatory, main and final parts of the training session of specially selected mobile games and gaming assignments [3; 8]. In the preparatory part of the training session, games and game assignments for the concentration of attention and setting up children for future physical activity were conducted, games with rhythmic walking and additional gymnastic movements, demanding from the players organized, coordinated movements and contributed to overall physical development. In the main part of the lesson, games and medium and high intensity game tasks were conducted to develop speed and agility. Also, games were used in which children after a quick run with eversion, jumping, jumping could rest. The prevailing place was occupied by games with short rushes in all

directions, in a straight line, in a circle, with a change in the direction of movement (such as «catch-up-run»), with a twist, with bouncing on one or two legs, with jumps through conditional obstacles (a ditch is drawn) and through objects (a low bench), with the transfer, throwing, catching and throwing balls at a distance and at the target, with various movements of imitative or creative nature. In the final part, games were used to relax and concentrate on further activities not related to the training process [3; 9].

Research methods: theoretical analysis and generalization of literary sources; pedagogical observations; testing; pedagogical experiment; methods of mathematical statistics.

Results of the research and their discussion

At the core of the methodology for the development of the speed-strength abilities of trampoline athletes 7–8 years was the use of specially selected mobile games and game assignments during the entire training session [3; 9]. To test the effectiveness of the developed methodology, a special pedagogical experiment was conducted. In the course of the experiment in the training process of young trampoline athletes developed method was implemented and observed the dynamics of speed-strength abilities (Table). As can be seen from the presented materials, in the test «Throwing a small ball» young trampoline athletes showed an average result of 9,1 m at the beginning of the experiment and a high enough end – 14,4 m. The difference between these indicators is statistically significant, $t_p=8,4>t_{gr}=2,78$. This means an objective improvement of the result, which increased by 58% (see Table). When performing the test exercise «Jumping up in a bent position» athletes of 7–8 years showed an average result of 12,1 times before the experiment and 20,4 times after it. A comparison of these results by the Student test shows that the difference between the mean group values is statistically significant ($p<0,01$), the improvement of the results is 68% (see Table). It should be noted that according to this test the group of children studied became more homogeneous – V=11,9% (see Table). In the process of comparative analysis of indicators of the development of speed-strength abilities in the test «Hanging leg raises», a significant improvement in the results after the proposed technique, $t_p=5,6>t_{gr}=2,78$. Improvement of the result was 34% (see Table). The results of the «Rope climbing» test have also changed over the period of using the game method in the preparatory, main and final parts of the training session for trampoline athletes at the initial training stage. If at the beginning of the experiment young trampoline athletes could perform climbing along the rope on an average of 2,3 m, then at the end of the experiment this result increased to 3,9 m (see Table). The result of comparing these indicators indicates a statistically significant difference ($p<0,01$). Thus, the increase in the results as compared with the beginning of the experiment is 69%. The results of the study also showed that in the test «Triple jump on the right and left», which was used to determine the explosive force, mean group result at the beginning of the experiment on the right leg was 198 cm, on the left – 204 cm. After applying the experimental technique, the result on the right leg was 209 cm, on the left – 216 cm (see Table). The difference between these indicators is statistically unreliable ($p>0,05$).

The results of the performance of the test «Long jump from place» (110,7 cm at the beginning of the study and 134,6 cm at the end), obtained by young athletes, indicate that the difference between their average results is statistically not significant, since $t_p=1,15<t_{gr}=2,06$. Their increase was 22% (see Table). In the next test «Jump over rope» during the experiment, the difference in the mean group results was also unreliable ($p>0,05$). But the coefficient of variation improved by almost two times, it indicates that the group has become more homogeneous in the performance of this test (see Table). Results

Dynamics of speed-strength abilities of young trampoline athletes in the course of pedagogical experiment (n=14)

No.	Test	Before experiment	After experiment	Before experiment	After experiment	Growth, %	Confidence estimation	
		$\bar{X}\pm m$		V (%)			t	P
1.	Throwing a small ball (m)	9,1±0,4	14,4±0,5	16,6	11,4	58	8,4	<0,01
2.	Jumping up in a bent position (number of times)	12,1±0,9	20,4±0,7	26,5	11,9	68	7,5	<0,01
3.	Hanging leg raises (number of times)	9,4±0,4	12,6±0,4	14,2	11,9	34	5,6	<0,01
4.	Rope climbing (m)	2,3±0,2	3,9±0,2	31,8	19,9	69	5,4	<0,01
5.	Triple ump (cm) right	198±17,4	209,0±17,2	31,6	29,6	5	0,4	>0,05
	Triple ump (cm) left	204±16,3	216±16,1	28,6	26,9	6	0,5	>0,05
6.	Long jump from place (cm)	110,7±8,7	134,6±9,8	9,33	9,52	22	1,15	>0,05
7.	Jump over rope (number of times)	16,4±2,9	21,6±1,9	64,4	33,4	32	1,5	>0,05
8.	Jump up from a place without a swing in hands (cm)	12,6±0,9	22,0±0,7	25,5	11,8	75	8,3	<0,01
9.	Sit-up (number of times)	17,8±0,9	23,4±0,7	23,6	18,8	31	4,6	<0,01

Note. *$p=0,01$, $t_{gr}=2,78$; $p=0,05$, $t_{gr}=2,06$.*

of the study also showed that in the «Jump up from a place without a swing in hands» test, which was also used to assess the level of development of speed-strength qualities, athletes of the initial training group showed a result of 12,6 cm before the experiment and 22,0 cm – after. The difference between these indicators is statistically significant ($p<0,01$). Improved results were 75% (see Table). It should be noted that according to the test at the beginning of the experiment the group of children studied was less homogeneous (V=25,5%) than at the end (V=11,8%), which indicate the effectiveness of the experiment. Similar positive changes in the test results were observed when the test «Sit-up» was performed 17,8 times at the beginning of the experiment and 23,4 times at the end, the increase in the results was 31% (see Table). According to the Student's test, the difference between the average indicators of this test is statistically significant (see Table). Thus, for most of the proposed tests, there is a tendency to increase the level of development of the speed-strength abilities of children in the experimental group with significant differences ($p<0,05$; $p<0,01$).

Conclusions

Based on the results of repeated testing of trampoline athletes, statistically significant differences in the initial and repeated test results were recorded for almost all indicators (except for tests: triple jump on the right and left, long jump from place, jump over rope), That testifies to the influence of the developed methodology on the development of the speed-strength qualities of the trampoline athletes. As a result of repeated testing in all tests, the value of the coefficient of variation became statistically significantly smaller. So, the group has become more homogeneous in terms of the level of development of speed-strength abilities, which is one of the results of the impact of the game method.

Prospects for further research

In the future, it is planned to evaluate the influence of the developed method of developing the speed-strength abilities of athletes at the stage of initial training using the game method in other gymnastic sports.

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