

**INTEGRATED DEVELOPMENT OF TECHNICAL
AND PHYSICAL PREPAREDNESS OF 7-8-YEARS-OLD FEMALE TENNIS
PLAYERS**

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Purpose: to research changes in technical and physical preparedness of 7-8-year-old sportswomen under the influence of classes on the program of CYSS.

Material and methods: theoretical analysis and generalization of scientific and methodological literary sources; testing of technical and physical fitness, pedagogical experiment, methods of mathematical statistics. The research involved 7-8-year-old girls in the initial training group of the second year of study.

Results: reliable changes in physical preparedness in in throwing a tennis ball to the range - by 39,8 % ($t=3,70$, $p<0,01$), in the exercise of catching a falling stick - by 12,7 % ($t=5,00$, $p<0,001$); the shuttle run in 5 directions with rackets "Fan" - by 8,9 % ($t=2,40$, $p<0,05$). Positive changes were obtained but had no valid results in other control exercises ($p>0,05$). In technical preparation, positive reliable changes in exercises were obtained: in impacts from the rebound from the wall by 33,3 % ($t=2,20$, $p<0,05$) and in impacts from the rebound through the grid from the coach basket by 56,4 % ($t=2,70$, $p<0,05$). Correctly selected physical fitness exercises allowed the tennis players to approach the ball in time to hit the ball and improve the test results. It was revealed that the improvement in indicators in long jump, throwing a tennis ball at a range and accuracy contributed to an increase in the importance of correlation links to an average

and high level of indicators in hits from the rebound from the wall and through the net, in serve.

Conclusions: the introduction of the methods for the integrated development of physical qualities and technical preparedness under the program of CYSS contributed to reliable changes in indicators. Ways were determined for the further improvement of speed and high-speed and power abilities, serving, and strokes of female tennis players.

Keywords: female tennis players, physical preparedness, indicators, techniques.

Introduction

The effective improvement of fitness of young tennis players remains one of the urgent problems in the modern conditions of sports training. To achieve success in tennis, sportsmen need adequate physical, technical, tactical, and psychological training, the high level of which is laid down already at the initial stage of training.

One of the most important trends in the development of modern tennis is the search for new, more effective, means and methods of training. In their scientific works, experts argue that developed physical qualities are extremely necessary for a successful game of tennis [7, 9].

The training programs for tennis players describe the structure of the training process and the sequence of exercises at the initial preparation stage [4, 11, 12]. The analysis of methods of children's preparation at the initial stage in tennis indicates the orientation of the training process towards the development of physical qualities, especially speed and high-speed and power character, coordination abilities, mastery of the main elements of the game and gradual inclusion in competitive activities among children of their age contributes to a further increase in the level of fitness of sportsmen [8, 13].

To determine the level of physical and technical fitness of tennis players, in particular, at the initial training stage, a number of tests are used according to the CYSS program [1, 5].

At the same time, the search for effective methods of training in tennis at the stage of initial training contributes to a stronger foundation for the preparedness of

sportsmen and high results in further competitive activities, which indicates the relevance of the chosen topic.

Connection of the research with scientific and practical tasks, plans, programs.

The research was carried out in accordance with the theme of the RW plan of Kharkiv state academy of physical culture. The initiative topic is “The improvement of the educational and training process in sports games”. RW state registration number: 0119U101644 (2019-2023).

Purpose of the research is to investigate changes in technical and physical fitness of 7-8-year-old female tennis players under the influence of classes under the CYSS program.

The research tasks:

1. To determine the level of technical and physical fitness of female tennis players.
2. To investigate changes in technical and physical fitness of female tennis players under the influence of classes under the CYSS program.
3. To establish relationships between indicators of technical and physical fitness of 7-8-year-old female tennis players.

Material and Methods of research

The research involved 12 girls aged 7-8 years in the initial training group of 2 years of study. The research was carried out for 5 months on the basis of the tennis club “Khvyliya” in Kharkiv.

Testing of technical preparedness indicators was carried out on exercises: rebound from the wall, rebound through the grid from the coaching basket, serving through the grid, volleys through the grid. To determine the physical fitness of young female tennis players, control exercises were used: throwing a tennis ball to the range, running 18 m; shuttle run in 5 directions; catching a falling stick; long jump; getting in a serve with the leading hand.

The pedagogical experiment took into account the results of preliminary tests of the fitness level of sportswomen and determined the method of training female tennis players. The method used exercises and methods that contributed to a

comprehensive increase in the physical and technical fitness of sportswomen. The methodology was used according to the CYSS program [1, 4] for sportswomen of the initial training group 2 years of training in tennis. The training was carried out 3 times a week for 1,5 hours. At the end of the preparatory and at the beginning of the main part of the training, exercises were performed for the integrated development of coordination, speed abilities, and technical preparedness of sportswomen. At the end of the lesson, comprehensive training of high-speed and power abilities and endurance was carried out along with the improvement of the technical preparedness of female tennis players. Classes were held using the game method using outdoor games.

Exercises were used for speed and high-speed and power abilities for the development of physical fitness, namely, various jumps: long lumps, side-up, up, up-back from the place, from the run, various jumps with a racecourse; throwing a tennis ball to the range, starts from different positions with rackets, running exercises with acceleration; for coordination abilities - catching a tennis ball in various positions at the initial moment and at the top of its rebound, throwing a tennis ball to the ground from different distances, exercises with balls and rackets on the coordination ladder; for endurance - normal long run, interval running sideways and backs forward with acceleration, for the development of strength - exercises with an expander for the hand, throwing the stuffed ball with movements that are similar to performing strokes on the left, right, serving, bending the extension of the hands, lying. After mastering the exercises, sportswomen performed training tasks using the playing and competitive method.

Attention was paid to the approach to the ball, performing hits and moving to the starting position, exercises with the ball on the spot and in the movement were used in specially preparatory means, various racket hits were performed on the ball from a rebound, volleys, and serves in technical training. Female tennis players learned to keep the ball in the game, lead the game to the score.

Results of the research

The primary pedagogical testing revealed that the development indicators of 7-8-year-old female tennis players have satisfactory results for this age in accordance with the standards of CYSS [1, 4].

After the pedagogical experiment, reliable changes in physical fitness indicators of female tennis players in exercises were revealed: for speed and high-speed and power - throwing a tennis ball to the range, the average result increased by 39,8 % ($t=3,70$, $p<0,01$) and catching a falling stick by 12,7 % ($t = 5,00$, $p<0,001$); for dexterity and high-speed endurance in the shuttle run in 5 directions with rackets “Fan”, the result increased by 8,9 % ($t=2,40$, $p<0,05$). In other control exercises, positive changes were obtained but had no valid results. So, the result in run on 18 m increased by 18,8% ($t=1,10$, $p>0,05$); in the test “standing long jump” by 9,4 % ($t=1,50$, $p>0,05$), in getting in a serve with the leading hand – 29,2 % ($t=2,00$, $p>0,05$). (Tab. 1).

Table 1

Changes in physical fitness of female tennis players after the pedagogical experiment (n=12)

№	Control exercises	Before the experiment n=12	After the experiment n=12	Confidence assessment t; p	Changes in indicators, %
		Xav.± m	Xav.± m		
1	Throwing a tennis ball to the range, (m)	10,3±0,20	14,4±1,10	t=3,70 p<0,01	39,8
2	Shuttle run in 5 directions with rackets “Fan”, (s)	19,2±0,40	17,5±0,60	t=2,40 p<0,05	8,9
3	Standing long jump, (cm)	131,4±3,50	143,8±7,60	t=1,50 p>0,05	9,4
4	Run on 18 m (s)	4,8±0,20	3,9±0,80	t=1,10 p>0,05	18,8
5	Catching a falling stick, (cm)	19,8±0,40	17,3±0,30	t=5,00 p<0,001	12,7
6	Getting in a serve with the leading hand, from 12 times, (number of hits)	4,8±0,40	6,1±0,50	t=2,00 p>0,05	29,2

The obtained unreliable results in run on 18 m, in standing long jumps and in getting in a serve with the leading hand indicate the need to use more exercises to develop starting speed and running along the distance, performing various leaps forward, on the other hand, sure to develop high-speed and power abilities and improve coordination.

In technical preparation, reliable changes in exercises were obtained: in impacts from the rebound from the wall by 33,3 % ($t=2,20$, $p<0,05$) and in impacts from the rebound through the grid from the trainer's basket by 56,4 % ($t=2,70$, $p<0,05$). The net feed results improved by 37,5 % ($t=0,39$) and volleys through the grid increased by 23,1 % ($t=0,83$), but hadn't significant changes ($p>0,05$) (Table 2).

The analysis of technical preparedness indicators of female tennis players shows that the level of possession of the racket and the performance of technical techniques with the ball improved, but sportswomen need to develop coordination abilities such as the ability to spatiotemporal orientation, coordination of movements, to develop a sense of the ball.

Table 2

Changes in technical fitness of female tennis players after the pedagogical experiment, (n = 12)

Control exercises	Units of measurement	Testing indicators		Confidence assessment t; p	Changes in indicators %
		Before the experiment n=12	After the experiment n=12		
		Xav.± m	Xav.± m		
Volleys through the grid	hits	1,3±0,20	1,6±0,30	t=0,83 p>0,05	23,1
Bounces from the wall	hits	10,8±1,20	14,4±1,10	t=2,20 p<0,05	33,3
Bounce strokes through the grid	hits	3,9±0,40	6,1±0,70	t=2,70 p<0,05	56,4
Serves through the grid	hits	0,8±0,30	1,1±0,70	t=0,39 p>0,05	37,5

The correlation analysis identified significant relationships of indicators before the pedagogical experiment (Table 3). So, the average level of feedback turned out to be between throwing a tennis ball to the range and shuttle run “Fan” ($r = -0,71$).

Bounce strokes through the grid have average relationships with standing long jump ($r = 0,69$), getting in a serve with the leading hand ($r = 0,77$), and bounce from the wall ($r = 0,73$). Serve indicators correlate with bounce strokes through the grid ($r = 0,67$).

The high level of significance of the indicators turned out to be between getting in a serve with the leading hand and standing long jump ($r = 0,94$), which indicates a dependence of coordination and high-speed and power abilities for the correct performance of the technical exercise by sportswomen.

Table 3

Relationship of indicators of technical and physical fitness of female tennis players before the pedagogical experiment, (n = 12)

	1	2	3	4	5	6	7	8	9	10
1	1									
2	-0,71	1								
3	0,51	-0,27	1							
4	-0,51	0,41	-0,29	1						
5	-0,42	0,47	-0,36	0,59	1					
6	0,37	-0,15	0,94	-0,12	-0,14	1				
7	0,18	-0,40	-0,18	-0,52	-0,39	-0,21	1			
8	0,44	-0,58	0,17	-0,41	-0,06	0,30	0,52	1		
9	0,59	-0,49	0,69	-0,34	-0,14	0,77	0,34	0,73	1	
10	0,24	0,11	0,34	0,13	0,26	0,49	0,22	0,28	0,67	1

Note. 1-6 indicators of physical fitness: 1-throwing a tennis ball to the range (m); 2- shuttle run “Fan”(s); 3- standing long jump; 4-run on 18 m (s); 5- catching a falling stick (cm); 6- get in a serve with the leading hand (hit) **7-10 technical readiness indicators:** 7- hit of the rally through the net (hit); 8- bounce from the wall (hit); 9- bounce from the bounce through the grid (hit); 10- supply through the grid to the target (hit).

After the pedagogical experiment, more significant connections between the indicators of technical and special physical fitness were determined (Table 4). The average level of connections revealed between the indicators of standing long jump with throwing a tennis ball to range ($r = 0,63$) and shuttle run “Fan” ($r = 0,60$) respectively indicate the selection of exercises for the development of high-speed and power abilities of sportswomen. The correlation of connections in tennis ball throws

at the range and tennis ball throws at the accuracy ($r=0,72$) shows the improvement in the performance of the supply elements by female tennis players. This opinion is supported by the average relationship of the performance of the serve to range ($r=0,73$), to standing long jump ($r=0,64$), to volleys ($r=0,69$), and high significance with rebound strokes through the grid ($r=0,84$), but this wasn't enough for the reliability of the feed results.

High and medium connections between volleys and rebound strokes ($r=0,74$) and rebound strokes through the grid ($r=0,87$) indicate the increase in the level of racket ownership among female tennis players, the increase in the accuracy of performing various strokes.

Inverse correlations were found in indicators catching a falling stick with blows from the rebound through the grid ($r=-0,72$) and the supply ($r=-0,66$) emphasizes the presence of errors in the sportswomen in the technical performance of strokes. Errors in performing strokes in movement can explain the inverse relationships between the indicators of strokes from the rebound through the grid and run on 18 m ($r=-0,72$).

Table 4

Relationships of technical and physical fitness indicators of female tennis players after the pedagogical experiment, (n = 12)

Indicators	1	2	3	4	5	6	7	8	9	10
1	1									
2	0,16	1								
3	0,63	0,60	1							
4	-0,27	0,15	-0,06	1						
5	-0,45	0,25	-0,38	0,37	1					
6	0,72	-0,09	0,31	-0,25	-0,59	1				
7	0,21	0,18	0,43		-0,49	0,04	1			
8	0,34	0,21	0,49	-0,51	-0,46	0,45	0,74	1		
9	0,40	-0,14	0,29	-0,71	-0,72	0,28	0,87	0,68	1	
10	0,73	0,13	0,66	-0,41	-0,66	0,38	0,69	0,58	0,84	1

Note. 1-6 indicators of physical fitness: 1-throwing a tennis ball to the range (m); 2- shuttle run "Fan"(s); 3- standing long jump; 4-run on 18 m (s); 5- catching a falling stick (cm); 6- get in a serve with the leading hand (hit) **7-10 technical readiness indicators:** 7- hit of the rally through the net (hit); 8- bounce from the wall (hit); 9- bounce from the bounce through the grid (hit); 10- supply through the grid to the target (hit).

Conclusions / Discussion

The analysis of scientific and methodological literature indicates the relevance of the research. The results are supported by the authors' researches [2, 4, 8]. The data of domestic [7, 11] and foreign [13, 14, 15] authors were also expanded, who were engaged in the search for effective methods for improving the fitness of sportsmen in tennis. The results of physical fitness after the pedagogical experiment revealed shortcomings in the development of starting speed, speed-power fitness, and coordination abilities of female tennis players and determined the need for further directed selection of training means and methods. The need for such exercises at the initial training stage was emphasized in their affairs by scientists [2, 3, 9].

Analyzing the results of technical preparation, reliable positive changes in female tennis players were in bounces from the wall, rebounds. Properly selected physical fitness exercises, namely, the development of the muscles of the hand and forearm, legs and muscles of the trunk, various movements from various positions with a variable rate of execution, the number of steps allowed to be correctly suited to perform the impact, to hold the racket well and to improve the test results in impacts. Insufficient accuracy of the feed and hit of the rally affected unreliable changes in the test results. When performing all the exercises, the coach demanded that the female tennis players not only accurately hit the target, but also properly perform the technical technique. The results are supported by the authors' researches [1, 4, 8, 11]. The primary pedagogical testing revealed that the indicators have satisfactory results for this age by the standards of CYSS.

The applied methodology of the complex development of physical qualities and technical preparation under the CYSS program contributed to reliable positive changes in indicators of physical fitness of female tennis players in throwing a tennis ball to the range of 39,8 % ($t=3,70$, $p<0,01$), catching a falling stick by 12,7 % ($t=5,00$). In other control exercises, positive changes were obtained but had no valid results ($p>0,05$).

In technical preparation, positive reliable changes in exercises were obtained: in impacts from rebound from the wall by 33,3 % ($t=2,20$, $p<0,05$) and in impacts

from the rebound through the grid from the coach's basket by 56,4 % ($t=2,70$, $p<0,05$).

The correlation analysis after the pedagogical experiment confirmed the relationship between physical and technical fitness indicators. It was revealed that the improvement in indicators in the long jump, throwing a tennis ball to the range, and accuracy contributed to the increase in the importance of connections to average and high levels of indicators in hits from a rebound from the wall and through the grid, as well as in the feed.

Thus, it can be determined that the introduction of the methodology for the integrated development of physical qualities and technical training under the CYSS program contributed to reliable changes in indicators. Ways were determined for further improvement of speed, high-speed and power, and coordination abilities, serves and strokes of female tennis players.

Prospects for further researches. Based on the above, further researches are planned to be carried out in the direction of determining the impact of psychophysical abilities on the technical and tactical indicators of fitness of female tennis players at the stage of initial training.

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