

**DYNAMICS OF CHANGE IN INDICATORS OF COORDINATION
ABILITIES OF QUALIFIED FEMALE VOLLEYBALL PLAYERS UNDER
THE INFLUENCE OF USING A SET OF EXERCISES AND OUTDOOR
GAMES**

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Purpose: to study the dynamics of changes in coordination abilities of qualified female volleyball players under the influence of using a set of exercises and outdoor games.

Material and methods: the following research methods were used in the research: analysis of scientific and methodological literature; pedagogical experiment; pedagogical testing; methods of mathematical statistics. During the research, the pedagogical experiment was conducted and aimed at increasing the level of coordination abilities of qualified female volleyball players. A group of 10 qualified female volleyball players at the age of 18-21 years of the team “Kharkivnyanka” (Kharkiv) was chosen for its holding, who takes part in competitions of teams of the Major League of Ukraine. Such means as a set of special exercises

and outdoor were proposed for the development of coordination abilities, and appropriate tests were used to evaluate them.

Results: the analysis of the results of the pedagogical experiment showed that the average arithmetic values of the indicators for each of the four selected tests after the experiment were significantly higher compared to the results of the corresponding tests obtained before the experiment. The results of the corresponding comparative analysis using the Student's test proved the validity of the difference between values of the indicators of these tests.

Conclusions: the proposed means to increase the level of coordination abilities of female volleyball players justified themselves as effective. They can be used by team coaches in practical work to prepare players for a defensive role, which will contribute to improving the team's game performance in training and competitive activities.

Keywords: test, a set of exercises, coordination abilities, pedagogical experiment, outdoor, female volleyball players.

Introduction

An effective game in defense is one of the main factors for achieving success in the competitive activity of the team in modern volleyball [9]. A large number of aspects of the performance of defensive actions by volleyball players are closely related to the development of their coordination abilities. Therefore, this work is devoted to a detailed analysis of these abilities of qualified volleyball players who take part in the defensive actions of the team.

In modern scientific and methodological literature, several works [2, 7, 10, 13, 18] are devoted to the study of problems related to the study of the development of the coordination abilities of volleyball players.

So, the detailed analysis of literary sources devoted to the development of coordination abilities in modern volleyball was carried out in the work [8]. Various aspects of the development of the coordination abilities of volleyball players related to their performance of certain technical and tactical actions were studied. In the

work [12], the authors emphasize that highly coordinated actions with the ball in a safe position are extremely important for volleyball players. To develop coordination abilities among volleyball players, they recommend complex exercises that are performed at a rapid pace. The program for the development of coordination abilities at the stage of initial training of volleyball players is proposed in the researches of Ustinov T. B. and Prekurat O. O. [14]. According to the authors, the introduction of the methods of coordination training of volleyball players in training activities will contribute to the rapid and high-quality absorption of elements of the volleyball game technique. It was proved that the system of selection of means of coordination training should include the application of the most diverse exercises and their various combinations, aimed both at solving problems of general physical training and at forming the necessary motor skills [13]. Authors Boychuk R. I., Korop M. Yu. and Beliavskiy I. L. proved in the research [2] that the use of means for the development of special dexterity with elements of volleyball technique at the stage of preparing volleyball players for the highest achievements contributes to increasing the effectiveness of their competitive activities.

In the work [7], authors Korzh N. L., Zhestkov S. G., Ivanova N. B., Barska N. L., Chechel M. M. analyzed the impact of acrobatic exercises on the development of coordination abilities of volleyball players in the training process. It is noted that the use of special acrobatic exercises in combination with the game is the most rational way to develop the ability to navigate the site.

The author in his work [19] studies the role of coordination in the initial stages of training in volleyball, in particular, notes that coordination abilities, especially during puberty, play an important role in creating the prerequisites for the development of physical fitness and acquisition of motor skills. The model of development of coordination abilities is proposed.

The research [20] focuses on the influence of coordination on the accuracy of sets in volleyball, as an important factor in the efficiency of its execution in the game. It is emphasized that coordination is firmly linked to technique and accuracy of sets. To improve the accuracy of sets, it is recommended in the training process to pay

special attention to the creation of a large number of different movement structures, which can contribute to a more complete formation of coordination among volleyball players.

The factor analysis was carried out, which made it possible to obtain a structure of coordination abilities of volleyball players from five relevant components, which significantly affect the formation of their technical and tactical training [16]. It is recommended to use game exercises and circuit training to improve the specific coordination abilities of volleyball players.

The method of using the coordination ladder to improve technical skills and psychophysiological functions of young volleyball players was developed and tested experimentally [18]. Its positive impact on the quality of the training process of volleyball players was determined.

The analysis of literary sources showed that insufficient attention was paid to improve the coordination abilities of players participating in the organization of defense.

The purpose of the research is to study the change in coordination abilities of qualified volleyball players under the influence of the use of special means.

Material and Methods of research

The following research methods were used in the research: analysis of scientific and methodological literature; pedagogical experiment; pedagogical testing; the consistent pedagogical experiment was conducted, which was aimed at increasing the level of coordination abilities of qualified volleyball players and lasted 12 weeks. The research was attended by 10 volleyball players aged 18-21 years of the Kharkiv team, who take part in competitions of teams of the higher league of Ukraine. To evaluate the coordination abilities of volleyball players, appropriate tests were used during the pedagogical experiment. The time of the tests, the nature of the rest between attempts was constant for all volleyball players who took part in the experiment.

Results of the research

The development of physical qualities of volleyball players is to develop speed, strength, coordination abilities, and endurance in the course of physical exercises. This process is closely related to the formation of motor skills and is due to the volume and nature of the motor activity. The results of the performance of technical elements of the game depend on the level of development of motor qualities [1, 5].

There is no need for a versatile development of all physical qualities for players who perform certain functions in game actions during the game. So, the players of the defensive plan need to focus only on those of them who play a significant role in solving the specific tasks of performing the corresponding techniques of the game in which they have to participate. In particular, the development of coordination capacities is important for them. They manifest themselves in the ability to rebuild quickly their actions, which are organically associated with strength, speed, endurance, dexterity by an instant change in the playing situation on the playground. The coordination abilities of the defender are manifested in throws, falls, and roll-up actions during the game in defense [3].

As for the development of coordination abilities, the main means include acrobatic, imitation exercises of elements of the technique of playing volleyball and outdoor games. To this end, a wide variety of exercises are used in the training process, in which the player must proceed from unexpected situations on the site with the help of resourceful and quick actions [8, 11].

Among the physical qualities of volleyball players, coordination abilities occupy a special place. Their high level of development is a crucial prerequisite for the quality of development and improvement of the game technique. A player with a high level of coordination abilities quickly adapts to constantly changing conditions in the game and chooses the most effective means of its management [6, 19].

Any technical admission is based on old coordination links. The greater the reserve of various motor skills the player has, the more successful the mastery of the game technique is. In this regard, the main way to develop coordination abilities is to

enrich players with new diverse skills, to develop the coordination of movements [17].

The main means of developing the coordination abilities of volleyball players are physical exercises of increased coordination complexity, which contain elements of novelty. The complexity of physical exercise can be increased by changing spatial, temporal, and dynamic parameters, as well as by external conditions, combining motor skills, combining walking with jumps, running and catching objects, performing exercises on a signal or with a limited period [19].

Exercises in raising a sense of space, time, and the degree of development of muscle efforts are a special group of means. Exercises aimed at developing coordination abilities are effective until they are performed automatically. Then they lose their effectiveness because any skill that has been mastered up to this point doesn't stimulate the further development of coordination abilities [15].

The purpose of the pedagogical experiment proposed by us is to increase the coordination abilities of 10 qualified volleyball players who take part in the defensive actions of the Kharkiv team. We note that the central blockers weren't involved in the experiment, because they almost don't take part in the defensive actions of the team in competitive activities.

After the initial testing of this group of volleyball players, before the start of the experiment, the proposed by us a set of special exercises and outdoor games were introduced into the training process, which, in our opinion, will contribute to the development of the coordination abilities of volleyball players. Volleyball players used these means 2 times a week in the special preparatory or at the beginning of the main part of the training session for 12 weeks. When performing the proposed set of exercises, the repeated method and the method of "circuit training" were used as the most effective.

Special means were used, for example: in pairs: the first player is with the ball at the wall, the second is on the front line in different initial positions (sitting face or back to the partner, lying on the stomach or the back), the first player hits the ball in

the floor, the second player after bouncing the ball off the floor must catch up with the ball and perform a set from below with two hands to the partner.

Volleyball players are divided into two levels of the team, which line up in columns. According to the coach's signal, they make four falls from acceleration in a row, simulating the receiving of the ball with a turn over the right and left shoulder, and then make a get-away at 10-15 m and jump on two legs return to the corresponding column. Next, the next player does, etc. The team that wins faster and with fewer errors will finish the relay.

After using the proposed complex of exercises and outdoor games, this group of volleyball players was re-tested. As a result of a series of volleyball tests, before and after the experiment, relevant statistics on their coordination abilities were obtained.

The results of the absolute increase of the arithmetic mean values of the corresponding indicators after the experiment concerning their values obtained before its start are given in Fig. 1.

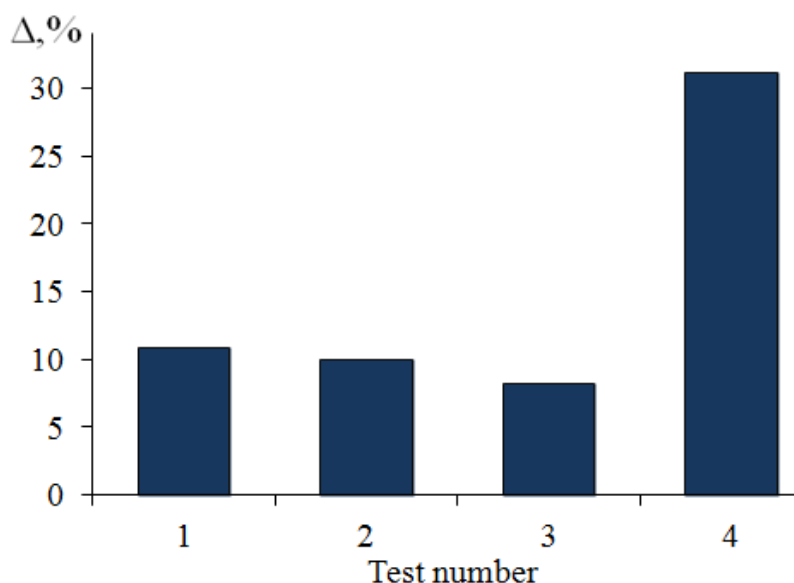


Fig. 1 Diagram of the change in the arithmetic mean values of the corresponding tests after the pedagogical experiment

Note: Test 1. Start from the front line of the platform. Jumping forward, running on the gymnastics bench, and imitating the attack hit at the net, insurance on the attack line, throw back, running to the front line.

Test 2. Running around the perimeter of one side of the site counterclockwise. Stuffed balls No. 1, 2, 3 lie on the attack line: No. 1 and 3 at a distance of 1 m from the side line, No. 2 - in the middle. Two players, who are located between balls No. 1 and 2 and 2 and 3, hold hoops vertically to the floor. Start from zone 1. Acceleration to ball No. 1, take the ball, run-off for the attacker strike and throw with two hands through the net into the attack zone; climb into the hoop, get-away to the ball No. 2, and further the same actions. After throwing ball No. 3 through the net, the player finishes with his back running forward along the sideline to the front.

Test 3. Shuttle running 5×6 m with the transfer of cubes.

Test 4. Imitation of the block at the net, insurance on the attack line then throw back. Performing the set from below with two hands for accuracy at the target sequentially from 8, 6, 3 m to 5 times from each point. Sets are considered lost that don't fall within the target.

As we can see in Figure 1, the highest increase in absolute value was obtained by the calculated value of test indicator No. 4 – 31,2%, the lowest increase received test result No. 3 - at the level of 8,2%, the results for test values 1, 2 improved by 10,8%, 9,9% compared to the results of the corresponding tests obtained before the experiment.

The results of the comparative analysis of the average statistical values of the indicators of coordination abilities of volleyball players in the pedagogical experiment are shown in Table 1.

Table 1

Results of evaluation of statistical validity of change in indicators of coordination abilities of qualified volleyball players in the pedagogical experiment (n1 = n2 = 10)

№	Test number	Before the experiment	After the experiment	t	p
		$\bar{X} \pm \sigma$			
1	Test №1, (s)	9,26±0,58	8,26±0,49	3,95	<0,05
2	Test №2, (s)	15,54±1,30	14,00±1,10	2,71	<0,05
3	Test №3, (s)	9,55±0,51	8,77±0,42	3,53	<0,05
4	Test №4, (number of times)	6,10±1,90	4,20±1,30	2,48	<0,05

Based on its results, it can be concluded that the values of all indicators increased after the pedagogical experiment. That is, the use of the proposed complex of various special exercises and outdoor games ensured such an effect in the training

process of volleyball players during the experiment. One of the reasons for improving the corresponding results is the use of various tasks in the training activity, which caused players more interest and, in this regard, increased motivation to perform these exercises and outdoor games.

The statistical validity of differences in the results of the comparative analysis of the average statistical values in indicators of these tests was evaluated, which were determined before and after the pedagogical experiment using Student's test, (see [4]). As Student's test value is $t > t_{gr}$, the difference between the calculated measures for all tests is statistically significant. Considering a valid positive change in values, the introduction of the proposed complex of exercises and outdoor games in the practice of the training process of qualified volleyball players can be considered effective. The results of our research allow us to recommend the proposed means for wide use by coaches in training and competitive activities to improve the values of these indicators of the coordination abilities of players of the defensive plan.

Conclusions / Discussion

The pedagogical experiment was conducted aimed at increasing the level of coordination abilities of qualified volleyball players. It used the proposed by us complex of special exercises and outdoor games, which contribute to the development of these qualities of volleyball players. The effectiveness of its implementation to increase the level of coordination abilities of volleyball players was assessed using the specially selected by us four tests. The comparative analysis of the results of the tests showed that the arithmetic average for each test obtained after the experiment was significantly higher than before its start.

Thus, it can be concluded that the proposed means to increase the level of coordination abilities of volleyball players proved their value as effective and can be used by team coaches in practical work to prepare players for a defensive role.

Prospects for further research. To research the influence of coordination abilities of qualified volleyball players on quantitative indicators of the effectiveness of defensive actions in the competitive activity of women's teams of the higher league.

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