DOI: https://doi.org/10.37547/mesmj-V7-I3-23 Pages: 179-186

MENTAL ENLIGHTENMENT SCIENTIFIC – METHODOLOGICAL JOURNAL

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http://mentaljournal-jspu.uz/index.php/mesmj/index

DEVELOPMENT OF REACTION AND CHOICE ABILITIES IN THE COMPREHENSIVE TRAINING OF SETTERS IN VOLLEYBALL

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ABOUT ARTICLE

Key words: Setter, reaction to a moving object, choice reaction, movement speed, setting accuracy, technical and tactical training, specialized exercise complex.

Received: 01.04.26
Accepted: 02.04.26
Published: 03.04.26

Abstract: The article analyzes the effectiveness of training aimed at developing setters' reaction to a moving object and choice reaction. A specialized set of exercises designed to improve movement speed, agility, and setting accuracy under complex game conditions was applied. The research results confirm that the proposed approach enhances setters' technical and tactical performance and increases the effectiveness of attacking actions.

Introduction. In modern volleyball, the increasing speed of the game and the growing complexity of tactical tasks require a high level of psychomotor preparedness from players, especially setters. As the organizer of the team's attacking actions, the setter must perceive and process a large amount of information within a short time and make optimal decisions. In this context, reaction to a moving object, particularly the ball, emerges as one of the decisive factors in the setter's performance.

Reaction to a moving object is not a simple reflex, but rather an integrated system involving the functioning of the visual analyzer, spatial perception, and the stages of movement planning and execution. In addition to assessing the speed and trajectory of the ball, the setter must simultaneously take into account the positioning of teammates and opponents as well as

the dynamics of their movements. According to research findings, reaction time to a moving object ranges from 0.25 to 1.0 seconds, with a substantial portion of this time devoted to the perception and processing of visual information.

Methodology. Under competitive conditions, the actions of the setter are often performed in limited space, under severe time pressure, and in the presence of various distracting factors. Therefore, the development of this ability requires the creation of special conditions within the training process. In particular, increasing the speed of the ball's flight, introducing its sudden appearance, reducing the distance between the player and the ball, and applying various distracting factors are considered effective means of improving reaction speed.

Purpose of the research.The purpose of the research is to determine the effectiveness of training means aimed at developing reaction to a moving object and choice reaction in the process of training setters.

Objectives of the research. 1. To theoretically analyze the speed and characteristics of setters' reaction to a moving object. 2. To determine the effect of choice reaction on setters' setting technique and the effectiveness of attacking actions. 3. To develop a specialized set of exercises aimed at improving reaction to a moving object and choice reaction. 4. To evaluate the effectiveness of the proposed training means based on a pedagogical experiment.

Results and discussion. In order to develop setters' movement speed, agility, and ability to accurately perform sets under complex game conditions, a specialized exercise complex was designed. This complex was aimed at modeling situations frequently encountered during play, such as spatial shifts, sudden changes in movement direction, decision-making based on signals, and the execution of movements under time pressure.

When designing the exercise complex, the specific demands of the setter's competitive activity were taken into account, including maximal-speed movement over short distances, adopting an optimal position after movement, maintaining balance while performing sets, and making rapid decisions under the influence of external signals. The gradual increase in exercise intensity and complexity ensured the coordinated development of psychomotor stability and technical accuracy.

The following table presents a set of exercises aimed at improving setters' movement speed and the effectiveness of setting under complex conditions, including the methods of execution, the number of repetitions and sets, and rest intervals (see Table 1).

Table 1

A set of exercises aimed at developing setters' movement speed under complex game conditions

№	Exercise name	Method of execution	Number of repetitions	Number of sets	Rest interval
1.	Sprint over 5-10 meters followed by setting the ball	The setter runs 5-10 meters at maximum speed. At the end of the distance, the ball is thrown to the setter, who then performs a set in the designated direction. In this exercise, adopting the correct position after the run and maintaining accuracy are of primary importance.	10	3	60 seconds
2.	Zigzag running followed by setting the ball	The setter runs at maximum speed in a zigzag pattern toward designated cones or markers. At the end of the distance, the ball is thrown to the setter, who then performs a set in the correct direction according to the coach's instruction.	6	4	60 seconds
3.	3 × 6-meter shuttle run followed by setting the ball	The setter performs a shuttle run over a 3 × 6 meter distance (i.e., with backward returns): 3 meters, then 6 meters, and back again for 3 meters. At the finish line, the ball is thrown to the setter, who performs an accurate set according to the coach's instruction.	4	3	60 seconds
4.	Running, lateral shuffling, and setting within a 9 × 9 m square	The setter performs rapid lateral shuffling runs within a 9 × 9 meter square. At each stopping point, the setter sets the ball according to the coach's instruction, then continues shuffling in another direction. This sequence is repeated four times while moving around the square.	4	3	75 seconds
5.	Backward and forward movement over 2-4 meters followed by setting the ball	The setter moves backward over a distance of 2-4 meters by walking or running. At the end of the movement, the setter turns around and	6	3	60 seconds

		accurately sets the ball according to the coach's instruction. During each repetition, the direction changes (left/right or toward the center).			
6.	Rapid movement and setting execution according to the "break-out" ("exit") system	The setter runs at speed from a designated starting point (for example, Zone 1 or Zone 6) toward a specified zone using a "break-out" movement. During the movement, the setter performs a set in accordance with the coach's instruction.	5	4	60 seconds
7.	Signal-based directional rapid movements	Based on the signal given by the coach (hand gesture or whistle), the setter immediately moves 2-3 meters in the corresponding direction (left, right, backward, or forward). The sequence of movements is not known in advance.	8	3	60 seconds
8.	Combined running, jumping, and setting	The setter runs 6-9 meters while lifting the knees high, then jumps, comes to a stop, and sets the ball according to the coach's instruction.	4	3	90 seconds
9.	Signal-based running with a 360° turn	After hearing the signal (hand gesture or whistle), the setter performs a 360° turn on the spot and then runs at speed in the designated direction. At the end of the distance, the setter sets the ball according to the given instruction.	5	3	60 seconds

The set of exercises presented in the table serves to comprehensively develop setters' rapid movement and setting performance. The exercises combine elements such as high-speed running over short distances, abrupt changes of direction, forward and backward movements, signal-based reactions, and performing sets simultaneously with movement. During the execution of these exercises, players developed the ability to assume an optimal technical position after movement, maintain balance, and perform accurate sets without loss of precision. In particular, exercises focused on selecting movement direction based on signals played an important role in developing choice reaction and expanded setters' ability to quickly adapt to changing game situations.

Exercises combining running, jumping, and turning created conditions close to complex game situations, thereby increasing players' psychomotor stability and technical reliability. The appropriate regulation of rest intervals between exercises made it possible to maintain movement quality under high-intensity conditions. Overall, the proposed exercise complex had a positive effect on improving setters' movement speed, agility, and setting accuracy, expanding the possibilities for effectively organizing attacking actions in complex game situations. The systematic implementation of this exercise complex into the training process contributes to enhancing the effectiveness of comprehensive setter training.

During the research process, special control tests were selected to determine the level of setters' technical and tactical preparedness, as well as the influence of reaction to a moving object and choice reaction on setting accuracy. These tests were aimed at assessing the setter's ability to make rapid decisions in various game situations, perform movements accurately, and adapt setting techniques to situational demands. At the end of the study, the initial and final performance indicators of the experimental and control groups were analyzed (see Table 2).

Table 2

General physical fitness indicators of the experimental and control group participants before and after the study, n = 20

№	Control exercises	Gr	Before the experiment		After the experiment		T	P
			$\overline{X}$	σ	$\overline{X}$	σ		
1	A setter performing a two-handed jump set from between Zones 3 and 2 to Zone 4 for an attacking hit (aiming into a special basket near the antenna in Zone 4), 15 attempts	EG	9,10	1,45	12,40	1,43	5,62	<0,001
		CG	9,00	1,56	11,20	1,40	3,63	<0,05
2.	A setter performing a two-handed jump set from between Zones 3 and 2 to Zone 2 for an attacking hit (aiming into a special basket near the antenna in Zone 2), 15 attempts	EG	9	1,49	11,1	1,45	3,50	<0,05
		CG	8,4	1,51	11	1,70	3,97	<0,01
3.	A setter performing sets to Zones 4 and 2 for attacking hits after touching the central and attack lines on the left and right sides. Touching the lines is required before each set	EG	9,9	1,66	13,20	1,55	5,03	<0,001
		CG	8,8	1,62	10,80	1,32	3,32	<0,05

	(aiming into special baskets near the antennas in Zones 4 and 2; 30 seconds to Zone 4 and 30 seconds to Zone 2).							
4.	Zone-based setting test: moving through Zones 1–2–3 and setting the ball to the zone indicated by the coach's command (20 attempts).	EG	12,60	2,17	14,90	1,91	2,75	<0,05
		CG	12,80	2,15	15,30	1,64	3,21	<0,05

Based on the results presented in the table, a relatively greater improvement was observed among the participants in the experimental group. Specifically, in the control test involving a setter performing a two-handed jump set from between Zones 3 and 2 to Zone 4 for an attacking hit, the experimental group demonstrated an average accuracy of 9.10 successful sets before the study, which increased to an average of 12.40 after the study. In the control group, the average number of successful sets increased from 9.0 before the study to 11.20 after the study. In the subsequent control test, in which the setter performed a two-handed jump set from between Zones 3 and 2 to Zone 2 for an attacking hit, the experimental group recorded an average of 9 accurate sets before the study and 11.1 accurate sets after the study. In contrast, the control group demonstrated an average of 8.4 accurate sets at the beginning of the study, which increased to an average of 11 accurate sets by the end of the study.

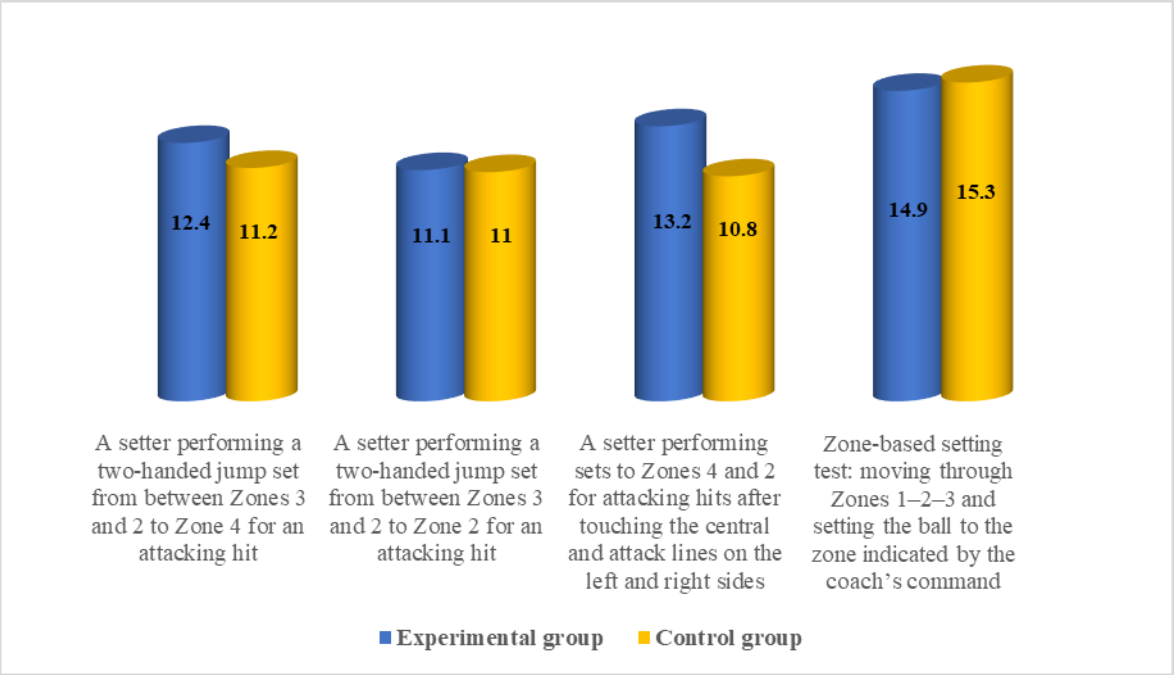

Figure 1. Dynamics of special physical fitness of the experimental and control group participants during the study

In the control test in which the setter touched the central and attack lines on the left and right sides and then performed sets to Zones 4 and 2 for attacking hits, the experimental group

recorded an average of 9.9 accurate sets before the study, which increased to an average of 13.20 after the study. In the control group, the average number of accurate sets increased from 8.8 before the study to 10.80 after the study. In the zone-based setting test, which involved moving across Zones 1–2–3 and setting the ball to the zone indicated by the coach's command, the experimental group performed an average of 12.60 accurate sets at the beginning of the study and 14.90 accurate sets after the study. In the control group, an average of 12.80 accurate sets was recorded before the study, increasing to 15.30 accurate sets after the study. At the end of the study, the results of the control tests assessing the level of special physical fitness in the experimental and control groups were analyzed. The analysis showed that a noticeable improvement in the level of special physical fitness was observed among the participants of the experimental group. This improvement indicates that the training exercise complex developed by us, together with the electronic device designed to enhance rapid decision-making ability, proved to be effective in the training process.

Conclusion. The results of the conducted study demonstrated that the targeted development of reaction to a moving object and choice reaction in the process of comprehensive training of setters plays a significant role in increasing the effectiveness of attacking actions. It was determined that the setter's ability to process a large volume of visual and spatial information within a short time, make rapid decisions in accordance with game situations, and perform accurate sets is directly related to the level of development of reaction speed and choice reaction. The implementation of the specialized exercise complex developed within the framework of the study into the training process led to a significant improvement in setters' movement speed, agility, and reliability in performing technical actions under complex game conditions. In particular, the increase in setting accuracy and variability observed in the experimental group ensured higher efficiency in organizing attacking actions and expanded the possibilities for breaking through the opponent team's defensive system.

Overall, the research results scientifically justify the necessity of systematically applying training methods aimed at developing reaction speed and choice reaction in the preparation of setters. The proposed exercise complex is recommended for practical use, as it serves to enhance setters' technical and tactical proficiency and to improve the effectiveness of attacking actions.

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