

**MENTAL ENLIGHTENMENT SCIENTIFIC –
METHODOLOGICAL JOURNAL****MENTAL ENLIGHTENMENT SCIENTIFIC –
METHODOLOGICAL JOURNAL**<http://mentaljournal-jspu.uz/index.php/mesmj/index>**A METHODOLOGY FOR OPTIMIZING THE SPECIALIZED PRE-COMPETITION
PHYSICAL TRAINING OF SKILLED VOLLEYBALL PLAYERS****Javohir Umirzokov***PhD candidate at the Uzbek State University of Physical Education and Sports**The Uzbek State University of Physical Education and Sports**E-mail address: javohirumirzoqov1998@gmail.com**Chirchik, Uzbekistan***ABOUT ARTICLE**

Key words: Volleyball, elite athletes, pre-competition preparation, specialized physical conditioning, the training process, workload, optimization, individualized approach, the recovery process, functional state, speed, endurance, jumping ability, athletic performance.

Received: 01.05.26**Accepted:** 02.05.26**Published:** 03.05.26

Abstract: This article provides a detailed analysis of methodological approaches aimed at improving the specialized physical conditioning of elite volleyball players during their pre-competition training period. It also examines the factors that ensure the effectiveness of these approaches, along with ways to plan and optimize the training process. Furthermore, scientifically-based load planning, the application of an individualized approach, the effective organization of recovery processes, and regular monitoring of athletes' functional state are considered as crucial factors. The research findings indicate that the developed optimized methodology significantly enhances athletes' physical fitness, reduces the risk of injury, and ensures consistently high results during competition. Furthermore, it was determined that using a set of exercises focused on specialized physical training during the pre-competition preparation phase markedly improves volleyball players' speed, jumping ability, and endurance.

Introduction. Nowadays, volleyball is globally recognized as a popular and rapidly developing team sport, with its professional advancement closely linked to athletes' physical preparation and the scientific optimization of training loads. The increasing pace of modern

gameplay, rapid movements, and shortened decision-making times place particularly high demands on players' specialized physical fitness.

During the pre-competition phase, key factors determining performance include speed-strength qualities, jumping height, start speed, lateral movement speed, reaction time, and endurance to repeated loads. Consequently, the development of a targeted training system aimed at enhancing these qualities represents a pressing scientific and practical challenge.

In recent years, athletes' movement speed, coordination, and rapid decision-making abilities have emerged as critical factors contributing to competitive advantage. Simultaneously, the proper regulation of training load volume, intensity, and recovery processes plays a decisive role in maintaining and improving functional readiness. Empirical evidence indicates that volleyball players with well-developed specialized physical fitness consistently demonstrate higher game performance.

However, at present, there is a lack of clearly defined, optimized load models for developing specialized physical fitness during the pre-competition phase. Improper load distribution and excessive repetitions often result in fatigue, functional overload, and decreased performance.

Therefore, developing an effective methodological approach for optimizing specialized physical training of highly qualified volleyball players during the pre-competition phase, scientifically organizing the training process, enhancing athletes' physical and functional capabilities, and ensuring consistently high competitive performance remains one of the most urgent tasks in contemporary sports science.

Materials and methods. The problem of monitoring sports training has been investigated in numerous domestic and international scholarly works. Matveev (1991) provided a detailed description of the principal functions of monitoring in the management of sports training, categorizing it into preliminary, current, and final monitoring types. Platonov (2015), within the framework of sports training theory, identified the structural components of the monitoring system and experimentally validated its influence on competitive outcomes.

In the field of para-sport, Tweedy and Vanlandewijck (2011) developed a functional classification system and emphasized the necessity of establishing distinct assessment criteria for each impairment group. Martin (2017) investigated the psychological preparation of para-athletes and identified the decisive influence of motivation and self-confidence on competitive success.

Regarding taekwondo, Falco et al. (2012) analyzed the tactical structure of competitive activity and quantified the role of decision-making speed in achieving victory. Notwithstanding

these contributions, research specifically dedicated to comprehensive monitoring methodologies in para-taekwondo remains insufficient—a gap that underscores the scientific novelty and practical significance of the present study.

The study was conducted between 2022 and 2024. Eighteen elite para-taekwondo athletes (8 female, 10 male; aged 18–32 years; classified as K40, K44, and K46 under World Taekwondo regulations) participated in the research. All participants were members of national or regional teams and had competitive experience at international tournaments.

A complex of research methods was employed, including pedagogical observation, testing of physical and functional preparedness, analysis of competitive performance, and statistical data processing. Monitoring indicators included technical-tactical actions, reaction time, strength and endurance parameters, as well as psychological readiness assessed through standardized questionnaires.

The monitoring process was carried out at three stages: preliminary (at the beginning of the training cycle), current (during the training process), and final (after competition periods). The obtained data were analyzed using descriptive statistics, correlation analysis, and comparative methods to determine the effectiveness of the monitoring system and its impact on athletes' performance.

Results and discussion

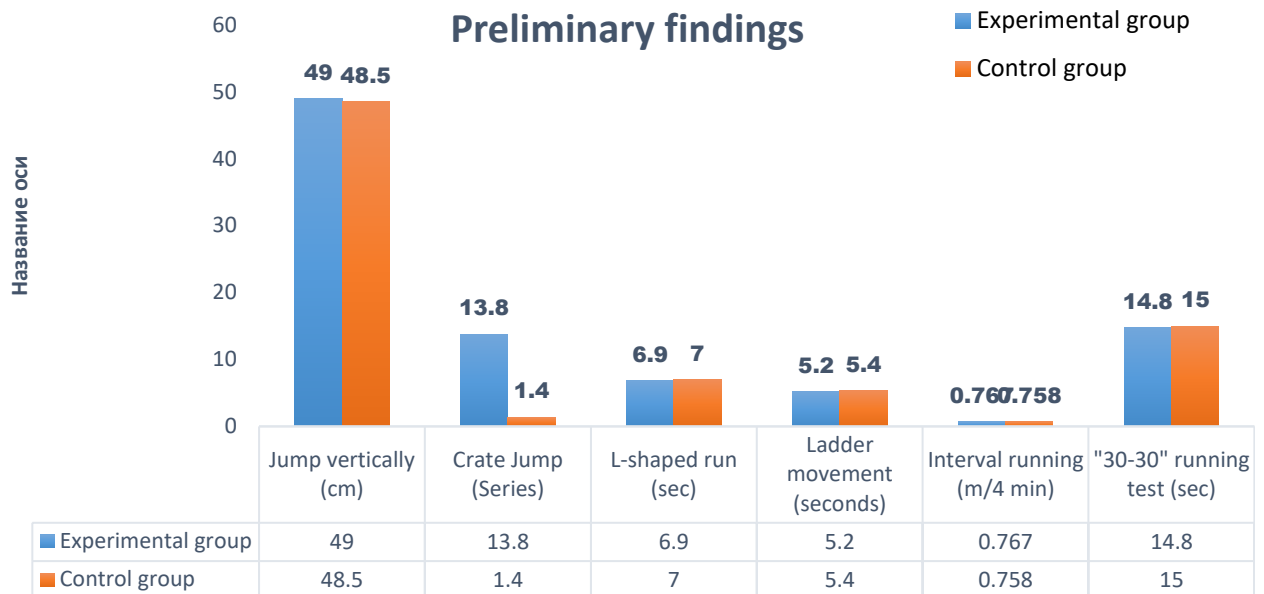
Table 1

Test exercises for assessing the special physical fitness of highly qualified volleyball players

Panda times new roman	Groups	Pre-research			t	P
		\bar{X}	S	V%		
Jump vertically (cm)	Experimental group	49.0	3.0	6.12	0.52	>0.05
	Control group	48.5	2.9	5.98		
Crate Jump (Series)	Experimental group	13.8	1.3	9.02	0.46	>0.05
	Control group	13.4	1.2	8.96		
L-shaped run (sec)	Experimental group	6.9	0.5	7.25	0.43	>0.05
	Control group	7.0	0.6	8.57		
Ladder movement (seconds)	Experimental group	5.2	0.4	7.69	0.55	>0.05
	Control group	5.3	0.5	9.43		
Interval running (m/4 min)	Experimental group	772	40	5.18	0.60	>0.05
	Control group	760	42	5.53		
"30-30" running test (sec)	Experimental group	14.8	1.2	8.11	0.42	>0.05

	Control group	15.0	1.3	8.67		
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Note: \bar{X} -mean value, S-sigma, V%-variation.



1. Results of the participants recorded before the study.

Analysis of the preliminary studies shows that there is no difference in the indicators between the control and experimental groups. This served as the basis for conducting the study, which allowed us to develop a set of exercises that enhance the special physical fitness of volleyball players in the experimental group (Table 2).

A set of exercises aimed at improving the special physical fitness of qualified volleyball players

Exercise title	Purpose	Execution method	Repeat
Developing speed and agility			
Start exercise with reaction signal	Increasing reaction rate and initial acceleration	At the -signal, run 5-10 m fast in different directions	8 times (in each direction) 3 repetitions. 20-second rest interval intensity is 60-70%
Side-speed traffic	Speed and coordination in defense	3-5 m distance fishes, sideways maximum speed movement	10 times, 3 repetitions. Rest: 40 seconds of intensity 60-70%
Coordination ladder exercises	Agility and footwork	fast movement through the ladder in various combinations	30 seconds, 4 repetitions Rest interval 60 seconds intensity 60-70%
Stopping and running backward in response to a signal	Developing the agility necessary for quick reactions, speed changes, braking techniques,	- the athlete stands at the starting line in a ready position. - the coach gives a whistle or a verbal signal.	5 times 4 repetitions Rest interval 60 seconds Intensity - 70-80%

	and defensive actions.	- the athlete runs 3-5 m forward at maximum speed. - as soon as the next signal is given, he stops abruptly and runs back, taking a defensive position.	
Bounce and explosive power			
Jump on top of the box (Box jump)	Jumping and leg strength	Jump on top of a 40-60 cm box	8-10 times, 4 repetitions. Rest interval 60 seconds Intensity - 70-80%
Block jumping	Explosive force	-sequential block jumping in front of the net	30 seconds 4 times Rest interval 60 seconds, Intensity - 60-70%
Approach jump	Explosive force for impact	Sequential block jump in front of the net	6 times, 4 repetitions. Rest interval 40 seconds, Intensity - 60-70%
Deep jump from the box	developing explosive strength, jumping ability, and the ability of muscles to quickly build strength	- the athlete climbs onto a 30-50 cm high box. - falls forward (without jumping, with a simple step). - jumps vertically to the maximum height in the minimum amount of time upon touching the ground. - hands are actively used (similar to blocking or attacking jumps).	8 times, 4 repetitions. Rest interval 60 seconds, Intensity - 70-80%
Strength and strength endurance			
Elastic belt movement	Developing speed and strength, strengthening the muscles of the back and legs, and increasing the ability to quickly transition into a defensive and barrier position	- installing elastic straps on the legs or body - moving sideways (left-right) and forward, taking into account resistance. -Using speed and maximum strength when performing the exercise	30 seconds, 4 repetitions. Rest interval 60 seconds, Intensity - 70-80%

Planck variations	Stabilization of the torso, development of body stability and balance, and improvement of technique and braking efficiency during jumps and blocks	<ul style="list-style-type: none"> - front plank: holding the body in a straight line on the elbows and legs - side plank: maintaining body stability on one arm and leg - muscles work statically in each exercise 	40 seconds, 3 repetitions. Rest interval 40 seconds, Intensity - 60-70%
Dual resistance exercises	Increasing strength endurance, simultaneous use of body and leg strength, developing the ability to fight with a partner in competitive conditions	<ul style="list-style-type: none"> -two athletes will face each other - Resist each other by pushing, pressing, leaning, or turning - During the workout all the main muscles in the body work 	40 seconds, 3 repetitions. Rest interval 60 seconds, Intensity - 60-70%
Reaction and coordination			
Tennis ball reaction	Increasing reaction speed, improving eye-hand coordination.	<ul style="list-style-type: none"> - the athlete stands ready in front of the coach. -the coach throws (or releases) the tennis ball in different directions or unexpectedly. -the athlete must move quickly and catch the ball. 	8 times, 2 repetitions. Rest interval 60 seconds, Intensity - 70-80%
Receive by turning on the signal (from the reverse position)	Reaction rate	<ul style="list-style-type: none"> - player stands with their back to the coach. -the coach gives the signal At the -signal, the player turns quickly. - receives the ball thrown or hit by the coach from below. 	6-8 times, 3 repetitions. Rest interval 40 seconds, Intensity - 60-70%
One-handed grip	Coordination	Right-handed and left-handed catch of a ball in the air	8-10 times, 4 repetitions. Rest interval 20 seconds, Intensity - 60-70%

This training program is designed for the comprehensive development of the special physical preparedness of elite volleyball players during the competitive season. The exercises, which are broken down by week, serve to build and strengthen the essential physical qualities required by athletes at each stage: speed, strength, endurance, agility, and coordination.

In the initial weeks, the focus is on improving jump height and explosive power through plyometric exercises. In the next stage, the athlete's movement coordination and reaction speed are enhanced using agility drills. The final stage involves endurance exercises to prepare athletes to perform consistently under high-intensity loads throughout a game.

This systematic approach aims to fully prepare volleyball players to meet the functional and technical demands of competition, increase their in-game movement efficiency, and enhance their fatigue resistance.

Table 3

Results recorded after the study and their analysis

Exercise name	Group lar	From research before			From research afterwards			t	P
		\bar{X}	S	V%	\bar{X}	S	V%		
Jump vertically (cm)	T/G	49.0	3.0	6.12	54.2	3.1	5.72	3.45	<0.05
	N/G	48.5	2.9	5.98	49.1	2.9	5.91		
Crate Jump (Series)	T/G	13.8	1.3	9.02	15.4	1.1	7.14	3.95	<0.05
	N/G	13.4	1.2	8.96	13.6	1.1	8.09		
L-shaped run (sec)	T/G	6.9	0.5	7.25	6.5	0.4	6.15	2.90	<0.05
	N/G	7.0	0.6	8.57	6.9	0.6	8.69		
Ladder movement (seconds)	T/G	5.2	0.4	7.69	4.9	0.4	8.16	2.65	<0.05
	N/G	5.3	0.5	9.43	5.3	0.6	11.32		
Interval running (m/4 min)	T/G	772	40	5.18	812	32	3.94	2.80	<0.05
	N/G	760	42	5.53	770	36	4.67		
"30-30" running test (sec)	T/G	14.8	1.2	8.11	16.5	1.1	6.66	2.15	<0.05
	N/G	15.0	1.3	8.67	15.5	1.1	7.09		

In our study, the results recorded by athletes showed changes depending on the type of exercise. Backward-forward rotation of the shoulder strap in the experimental group

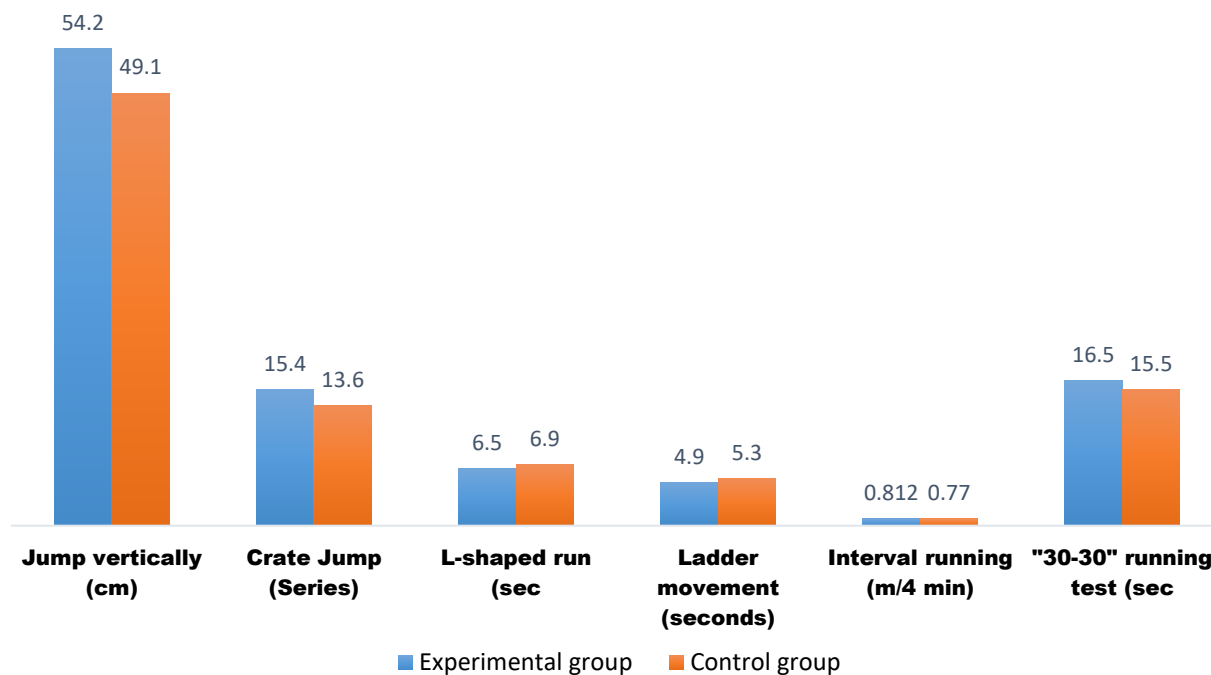


Figure 2. Results of the participants after the study

Vertical jump (cm): Experimental group: increased from 48.7 cm to 54.2 cm, with an improvement of +11.3%. This result indicates an increase in explosive strength and jump height. Control group: increased from 48.3 cm to 49.1 cm, with a slight improvement of +1.7%.

Box jumping (series) Experimental group: increased from 13.6 to 15.4, with an increase of +13.2%. This confirms the effectiveness of plyometric training. Control group: from 13.3 to 13.6, an increase of +2.3%.

L-shaped running (seconds) Experimental group: improvement from 7.0 sec. to 6.5 sec. -7.1% (shortened time - increased reaction and movement speed). Control group: improvement from 7.1 sec. to 6.9 sec. -2.8%.

Movement up the stairs (sec) Experimental group: -7.5% improvement from 5.3 sec. to 4.9 sec., indicating coordination and leg speed. Control group: -1.9% change from 5.4 sec. to 5.3 sec.

Interval running (4 minutes) Experimental group: increased from 765 m to 812 m, improving endurance by +6.1%. Control group: from 758 m to 770 m, with a change of +1.6%.

Running test "30-30" (sec). Experimental group: from 15.0 sec. to 16.5 sec., +10.0% improvement, indicating tolerance to high-intensity loads. Control group: from 15.1 sec. to 15.5 sec., +2.6% improvement.

Conclusions. The results of the study indicate that a training system aimed at enhancing the specialized physical fitness of elite volleyball players during the competitive season significantly developed their core physical qualities. The exercises, organized according to the

experimental program, were implemented in stages across plyometric, coordination, and endurance domains, which allowed for both individual and group work on each athlete's motor efficiency, endurance, and explosive strength.

According to the statistical analysis, the experimental group demonstrated statistically significant improvements ($P < 0.05$) in vertical jumps, box jumps, coordination drills, and endurance tests. Percentage analysis further confirmed these changes, with improvements in certain exercises reaching 10–32%, indicating a substantial advancement in the athletes' functional fitness. Conversely, the changes in the control group were minimal and statistically insignificant.

Therefore, it can be concluded that the proposed training system serves as a scientifically grounded, practically effective, and results-oriented approach to enhancing the comprehensive preparedness of elite volleyball players during the competitive season.

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6. The objective of the study is to develop and experimentally test an effective methodological system aimed at improving the special physical preparedness of elite volleyball players during the pre-competition period.

7. Research Methodology. Sixteen elite male volleyball players, aged 18–19, from the Uzbek State University of Physical Culture and Sports participated in the experiment. They were divided into two groups: an experimental group ($n=8$) and a control group ($n=8$). The

study was conducted on the basis of the "UzDJTSU" club at the Uzbek State University of Physical Culture and Sports.

8. Experimental group (n = 8): trained based on the new methodology.

9. Control group (n = 8): trained according to the traditional program.

10. The following complex exercises were utilized to conduct the study. Training sessions were carried out over a period of 8 weeks.