



# **CHANGES IN THE PHYSICAL PERFORMANCE OF HIGHLY QUALIFIED BASKETBALL PLAYERS DURING TRAINING UNDER THE INFLUENCE OF VARIOUS LOADS**

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**Annotation.** The analysis of results of the research of the level of development of special efficiency of young basketball players of 18-19 years and the possibility of its preservation in the course of the game is presented in article. It is established that such level of the studied qualities decreases in process of end of game parties more and more. The opinion is put forward that such dynamics of change of these qualities demonstrates instability of their status.

**Keywords:** basketball players, special working capacity, hopping endurance, shuttle run, heart rate, breath frequency, arterial blood pressure.

**ИЗМЕНЕНИЕ ФИЗИЧЕСКИХ ПОКАЗАТЕЛЕЙ ВЫСОКОКВАЛИФИТИРОВАННЫХ  
БАКЕТБОЛИСТОВ В ТЕЧЕНИЕ ТРЕНИРОВКИ ПОД ВОЗДЕЙСТВИЕМ РАЗЛИЧНЫХ  
НАГРУЗОК**

**Аннотатсия.** В статье анализируется динамика изменений некоторых показателей физического и функционального статуса у волейболистов 18-19 лет под влиянием различных нагрузок. Установлено, что исходные показатели, полученные до тренировки и до применения тестов значительно снизились под влиянием этих нагрузок. Однако, под влиянием игровых нагрузок наблюдалось еще большее снижение изучаемых показателей, что связано, очевидно, с недостаточно устойчивым развитием физического и функционального статуса обследованных юных баскетболистов.

**Ключевые слова:** показатели физического и функционального статуса, тест, нагрузка, прыжок, челночный бег, тренировка, игра, частота сердечных сокращений (ЧСС), частота дыхания (ЧД).

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KO‘RSATKICHLARI TURLI YUKLAMALAR TA‘SIRIDA O‘ZGARISHI**

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## YUQORI MALAKALI BASKETBOLCHILARDA MASHG‘ULOT DAVOMIDA JISMONIY KO‘RSATKICHLARI TURLI YUKLAMALAR TA‘SIRIDA O‘ZGARISHI

**Annotatsiya.** Maqolada yuqori malakali basketbolchilarda ayrim jismoniy va funksional ko‘rsatkichlarni mashg‘ulot hamda o‘yin yuklamalari ta‘sirida o‘zgarish tahlil qilingan. Aniqlandiki, mashg‘ulot va testlardan avval olingan dastlabki ko‘rsatkichlar shu mashg‘ulot va testlar yuklamalari ta‘sirida tushib ketgan. Lekin o‘yin yuklamalaridan so‘ng ushbu ko‘rsatkichlar yanada sustlashgan. Bunday holat tadqiqotda ishtirok etgan basketbolchilarning jismoniy imkoniyatlari ham, ularning funksional komponentlari ham mukammal shakllanmaganligidan darak beradi.

**Kalit so‘zlar:** jismoniy va funksional ko‘rsatkichlar, test, yuklama, sakrash, moksiksimon yugurish, mashg‘ulot, o‘yin, yurakni qisqarish soni (YUQS), nafas olish soni (NOS).

The relevance of the work. Maintaining the level of technical and tactical mastery in all sports, including basketball players, under the influence of long-term training and competitive loads is determined not only by physical fitness, but also primarily depends on functional capabilities. However, it is known from some sources that even highly skilled athletes experience a sharp decrease in their physical and functional capabilities under the influence of training and competitive loads.

It should also be noted that in some cases, physical and functional indicators decrease even after certain test loads. This is due to the lack of serious attention to the use of relaxation exercises aimed at restoring work capacity at the end of training and competitions (Matveev L.P., 2005). Volkov L.P., 2002; Platonov V.N., 2015; M.A. Godik, 2006; Belyaev A.V., 2000; Kholodov Zh.K.; Kuznetsov V.S., 2014; Furmanov A.G., 2007 Ayrapetyans L.R., 2006).

The purpose of the study. The study is dedicated to studying the dynamics of changes in certain physical and functional indicators in 18-19-year-old basketball players under the influence of various loads (training, competition, test loads).

The object of the research 44 volleyball players aged 18-19 years of the Uzbek State University of Physical Culture and Sports were selected. The following methods and tests were used in the study: determination of the maximum number of jumps to the marker placed 43 cm above the tips of the upraised hands (jump endurance): determination of heart rate (HR) and arterial blood pressure (BP) using the MI-4 instrument, determination of respiratory rate (RR).

The results of the study and their analysis. A comparative analysis of the research results revealed that the indicators of special work capacity before and after training in 18-19-year-old basketball players differed significantly from each other in the dynamics of changes. For example, in these basketball players, the maximum number of jumps to a marker installed at a height of 43 cm was  $32.9 \pm 3.43$  times. Therefore, it can be assumed that this maximum number of vertical jumps represents the jumping ability of these children. However, the question arises as to whether the maximum number of jumps deserving of such volume is sufficient for volleyball players of this age. According to A.V. Sukhanov, E.V. Fomin, and L.V. Bulkina (2014), during a 4-game game, a highly skilled basketball player averages 104 times for only offensive shots and blocking, while the range of individual scores, depending on the game's functions, is 77-115 times. During one workout, you have to jump up to 148 times. In addition, these basketball players have to make up to 260 more jumps to perform other technical techniques (pass the ball) and distractions. Therefore, the average number of jumps recorded in young basketball players participating in our study ( $32.9 \pm 3.43$  times) cannot be considered sufficient. Moreover, the relatively high cardiopulmonary value of this indicator indicates an unoptimal formation of jumping ability. In this regard, determining the functional value of maximum jumps, other tests expressing speed, and training loads is crucial for a more objective assessment of basketball players'



special work capacity. Thus, in 18-19-year-old basketball players who participated in the study, the maximum number of jumps before the test was  $78.5 \pm 2.83$  times/min, while after the test load, this indicator was  $129.4 \pm 3.92$  times/min (Table 1).

*1-table*

The dynamics of changes in performance indicators before and after training and test loads in 18-19 year old

basketball players. –  $n=44$  ( $\bar{X} \pm \delta$ )

Funksional testlar	Harakat testlari natija-lari	YUQS (marta/daq.)	NOS (marta/daq)	AQB (mm/s.u.)	
				Sistolik bosim	Diastolik bosim
Harakat testlari					
43 sm. balandda o'rnatilgan markerga maksimal marta sakrash (marta):	$32,9 \pm 3,43$	$\frac{78,5 \pm 2,83}{129,4 \pm 3,92}$	$\frac{14,2 \pm 1,12}{35,6 \pm 2,26}$	$\frac{116,9 \pm 3,15}{147,5 \pm 4,22}$	$\frac{81,8 \pm 2,16}{77,3 \pm 2,01}$
- mashg'ulotdan avval					
- mashg'ulotdan keyin	$25,4 \pm 3,14$	$\frac{158,2 \pm 5,02}{167,6 \pm 5,39}$	$\frac{36,7 \pm 2,76}{42,3 \pm 3,44}$	$\frac{155,5 \pm 3,71}{160,7 \pm 3,89}$	$\frac{76,2 \pm 2,11}{78,8 \pm 2,11}$
“Archasimon” yugurish 92 m. (sek.):	$24,4 \pm 2,04$	$\frac{72,5 \pm 2,92}{128,4 \pm 4,36}$	$\frac{13,6 \pm 1,02}{37,3 \pm 3,14}$	$\frac{126,3 \pm 2,46}{148,2 \pm 3,72}$	$\frac{71,5 \pm 1,80}{74,2 \pm 1,52}$
- mashg'ulotdan avval					
- mashg'ulotdan keyin	$27,9 \pm 2,47$	$\frac{169,3 \pm 3,97}{171,5 \pm 4,07}$	$\frac{39,2 \pm 2,18}{42,8 \pm 2,36}$	$\frac{158,4 \pm 3,01}{168,5 \pm 5,38}$	$\frac{73,5 \pm 1,92}{70,7 \pm 1,79}$
9-3-6-3-9 m.ga mokkisimon yugurish (sek.):	$8,3 \pm 0,78$	$\frac{68,6 \pm 2,01}{126,4 \pm 4,08}$	$\frac{14,8 \pm 1,27}{32,7 \pm 2,78}$	$\frac{123,3 \pm 2,16}{146,5 \pm 3,12}$	$\frac{70,4 \pm 1,53}{73,5 \pm 1,91}$
- mashg'ulotdan avval					
- mashg'ulotdan keyin	$12,7 \pm 0,99$	$\frac{137,7 \pm 4,72}{158,4 \pm 5,88}$	$\frac{37,8 \pm 2,03}{42,4 \pm 3,17}$	$\frac{148,8 \pm 3,24}{160,7 \pm 3,98}$	$\frac{72,6 \pm 1,67}{74,2 \pm 1,80}$

Izoh: YUQS – yurakni qisqarish soni; NOS – nafas olish soni; AQB – arteriya qon bosimi; suratda – testdan oldin; mahrajda – testdan keyin.

To study the objectivity of this opinion or conclusion, we conducted an additional study to determine the dynamics of changes in special work capacity in 18-19-year-old basketball players before and after a 4-game simulated game load. The results of the study are presented in Table 2. The results recorded in the table show that the maximum number of jumps before the start of the game was  $35.5 \pm 3.46$  times according to the corresponding test. It is likely that the fact that such an average score was recorded at a slightly higher rate (by 2.5 times) than the maximum jump score obtained before training is associated with motivational-emotional activity, which typically occurs in pre-game situations.

*2-table*

The dynamics of changes in special work capacity in basketball players aged 18-19 before and after a

4-game load. –  $n=24$  ( $\bar{X} \pm \delta$ )





Funksional testlar	Harakat testlari natija-lari	YUQS (marta/daq.)	NOS (marta/daq)	AQB (mm/s.u.)	
				Sistolik bosim	Diastolik bosim
Harakat testlari					
43 sm. balandda o'rnatilgan predmetga maksimal marta sakrash (marta):	35,5±3,46	<u>77,3±3,12</u>	<u>14,7±1,28</u>	<u>120,4±2,15</u>	<u>79,5±2,13</u>
- o'yindan avval		129,7±3,94	39,2±3,16	147,6±5,01	75,2±2,04
- 1 partiyadan keyin		136,2±4,13	33,5±2,46	139,6±4,07	70,7±1,92
- 3 partiyadan keyin		143,8±4,36	36,3±2,93	144,5±4,72	75,2±2,12
- 4 partiyadan keyin (o'yindan keyin)	28,2±2,82	<u>148,6±4,78</u>	<u>38,7±3,08</u>	<u>154,9±5,12</u>	<u>74,5±2,08</u>
		156,7±5,16	44,9±3,97	162,2±5,90	75,7±2,14
"Archasimon" yugurish	25,7±2,12	<u>74,6±2,97</u>	<u>15,3±1,36</u>	<u>127,4±2,29</u>	<u>72,5±1,97</u>
92 m. (sek.):		128,3±3,17	36,7±2,75	146,2±4,68	78,3±2,09
- o'yindan avval		135,2±4,11	32,4±2,46	138,6±4,07	70,7±1,92
- 1 partiyadan keyin		142,8±4,36	37,2±2,93	144,5±4,72	75,2±2,11
- 3 partiyadan keyin		<u>148,6±4,79</u>	<u>39,6±3,08</u>	<u>154,9±5,11</u>	<u>72,5±2,06</u>
- 4 partiyadan keyin (o'yindan keyin)	29,8±2,37	164,7±5,11	45,8±3,97	165,3±5,96	75,7±2,38

Note: heart rate - heart rate; NOS - respiratory rate; AQB - arterial blood pressure; in the numerator - before the test; in the denominator - after the test.

The sharp decrease in test scores obtained before the game load at the end of the game (after 4 games), the sharp increase in test and game loads, including the functional value of these loads (HR, NOS, AQB) after each game (4 games) compared to the initial (pre-match) indicators, indicates that the special physical work capacity of these young volleyball players is significantly weaker.

**Conclusion.** Based on the results of the conducted research, it can be concluded that the results of the tests used to assess the special physical work capacity of 18-19-year-old basketball players (maximum jump 35.5-31.9 times, sprinting 25.7-24.5 seconds) show a decrease in training and game loads, an increase in the value of loads confirms the insufficient development of physical and functional training in them. Achieving high results in modern volleyball, where competition is increasing and the volume and intensity of workloads are rapidly increasing, requires the possession of highly developed integrated physical, technical, tactical, and psycho-functional capabilities.

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