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Original Article

Efficiency of influence of performance of differentiated complexes of exercises on the development of physical qualities in female basketball players at the beginning of the preparatory period of training

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Abstract:
The scientific article assesses the effectiveness of the development of speed-strength qualities by specially composed sets of exercises performed on sectional classes by female basketball players during the 60-day mesocycle at the beginning of the preparatory period. The use in training by female basketball players of a wide variety of special exercises with their strict regulation on the developed sides of physical qualities has a positive effect on the education of motor abilities. A comparative analysis of the data showed that there may be an increase in speed-power qualities over a 60-day mesocycle of training up to 20%. There was no increase in indicators for basketball players in the accelerations at the 6-meter segment, which requires more frequent monitoring of this cycle in the mesocycle of the preparatory period by microcycles. These studies can find application in the practical work of coaches in basketball.
Key Words*:* basketball, motor abilities, training process, physical abilities, means and methods of physical education.

Introduction

In the Address of the Head of State Nursultan Nazarbayev (2012) to the people of the country in December 2012, the Development Strategy of the Republic of Kazakhstan until 2050 was presented. Where one of the important goals of the society in the strategy "Kazakhstan - 2050" was the national policy on the formation of a healthy lifestyle of Kazakhstanis. The National Center for Problems of Forming a Healthy Lifestyle was created with an emphasis on the development of physical education and sports, which should educate a culture of a healthy lifestyle.

The relevance of this scientific work is related to the implementation of a program to form a healthy lifestyle and solve the problems of scientifically-based physical health management of novice athletes, based on the optimization of the physical fitness of female basketball students. Using the means of physical culture, a selection of sets of physical exercises was carried out, the implementation of which was aimed at scientifically-based management of the development of physical fitness of female students engaged in groups in the basketball section.

Modern basketball is a team gaming sport that requires athletic training and perfect mastery of the motor and tactical skills of the game. The game is won by a well-played team, the players of which clearly know and can correctly and professionally perform their playing roles, consistently and selflessly achieve game superiority over the opposing team. The ball in the ring is thrown by one player, and the conditions for this action are created by all five players of the team. Preparation for the effective execution of the throw is the main content of the team's game in the attack, and getting into the ring is its main goal (Platonov, 2004, p. 808; Yahontova, 2006, p. 143).

The success of participation in the game lies in the ability of the basketball player to counteract an opponent to make passes, catch and dribble the ball, correctly attack the ring, making throws from different starting positions and from any distances. Modern basketball makes great demands on the level of physical fitness. Physical training is closely related to all other parties in the preparation of basketball players. The high level of development of speed, strength, agility, endurance becomes the main condition for mastering the technique and tactics of basketball (Skvortsova, 2007, p. 112; Grasis, 2002, pp. 145-146). In addition, the implementation of physical training contributes to the formation of important mental and moral-volitional qualities.

The research problem is connected with the peculiarities of basketball players' motor activity in competitive conditions characterized by a high pace of the game, this is caused by an increase in the percentage

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of using active forms of defense and attack, such as pressure, rapid breakthrough, tight guardianship of attackers throughout the field, etc. Acute game situations require the player athletic martial arts for the ball, jumping with maximum effort and movement around the site at maximum speed, with abrupt stops (Arutsev, 2003, p.173).

Material & methods

Today basketball is the most harmoniously developing sport. He is not trapped in the grip of intensification on the principle of "athleticism plus speed" alone, like other sports games. It contains the richest inner possibilities for the development of game thinking and the improvement of techniques.

Basketball is not only the most fascinating but also the most perfect of all kinds of sports. It is preferable to all others in terms of dynamics, a variety of game situations, entertainment and emotional perception (Gomelski, 1988, 2003, 2015).

The specificity of the structure and content of sports training of female basketball players, the choice of effective means and methods of physical training should be based on a scientific rationale for their use, taking into account the age and individual functional reserves of the body of basketball players (Baker, 2008).

At the present stage of the development of sport, the development of model levels of physical and functional preparedness and the creation of a bank of models for different periods of preparation, with the aim of using them for the search of gifted, talented girls who could show high results in student basketball, on the republican level in the national team of Kazakhstan and in world-class games.

Analysis of the scientific literature has shown a very small amount of scientific and methodological literature paying attention to the peculiarities of the physical training of female students in the preparatory stage of initial training. Most of the research in the available literature was performed with the participation of highly qualified basketball players.

The problem of organizing and conducting the training process, with an assessment of the dependence of physical fitness on the physical capabilities of female basketball players when teaching students in a higher education institution, in the annual training cycle is relevant, as it does not always allow to effectively form the technique of basketball player's movements. The reason for this may be insufficient control and consideration when planning the volume and intensity of the load of many bio pedagogical factors of age, sex, qualification, individual functional, psychological.

In the conditions of modern basketball development, it is necessary to consider in a new way the problems of further raising the level of students' sports achievements by means of physical education and sports with an emphasis on the search for new scientifically based training methods, organization structure, forms of training for sports reserve taking into account bio pedagogical approaches.

The analysis of the scientific and methodological literature and sports practice allows us to state the fact that in basketball there are still unresolved problems related to improving the quality of management of the students' training process to meet the high demands on their physical and functional preparedness, the foundations of which are laid and formed in junior age, and upon admission to the university require further formation and correction.

Improving the system of training athletes of university sports is an important problem in the theory and methodology of sports training (Verkhoshansky, 2010, p. 326; Matveev, 2007, p. 280). One of the most relevant areas of expertise is the scientific substantiation, construction, and content of the training process of athletes at various stages of long-term training, in the period of study at the university, paying significant attention to the dynamics of athletic training (Korneev, 2004, pp. 48-50).

Studying the features of formation of the level of physical development, physical fitness and functional state of basketball players, will allow to identify the features of the impact of basketball activities on the physical condition of athletes and adjust the volume of training loads of various orientations, taking into account the sensitive periods of motor skills and functional systems of the body of female basketball players.

Recently, in sports, both the number of competitions in the annual training cycle of basketball players has increased, and the speed of the game has intensified significantly due to the speed of technical actions, which determines the success of attacking and defensive actions. This is reflected, above all, in increasing the maneuverability and mobility of the players, in their desire to actively fight for the ball or place in each area of the site.

Observations on the game of students who started playing basketball at the institute revealed that they cannot all play effectively in the attack for 40 minutes. By the end of the meeting, the indicators of hitting the ball in the basket from the middle and long distances are significantly reduced, which indicates an insufficient level of development of physiological reserves, physical qualities and the rapid onset of fatigue from which the effectiveness decreases (Krzyzewski & Spatola, 2007).

In modern basketball, the level of development of physical qualities is the determining factor for the effectiveness of the game in the attack (along with technique and tactics) (Nesterovsky, 2008; Kostikova, Suslov & Furaeva, 2002; Paye B. & Paye P., 2008).

Considering that Kazakhstan's domestic basketball over the past decade has increased its demands for technical tactical skills and the ability of teams to play in competitions, so there is always a shortage of talented players, which indirectly indicates an insufficient system of training sports reserves, and hence the industry.

The way out of the situation created is largely connected with the introduction of modern scientific and methodological foundations of management and organization of the training process into the methodology of preparing a sports reserve, which is reflected in the fundamental research of recent years (Guba & Rodin, 2009). Experts note that significant reserves for the growth of basketball players skill lie in increasing the speed of performance of techniques by finding ways to improve the players' physical fitness, especially its speed-strength component.

It was assumed that the object of taking into account the level and structure of physical fitness will ensure the systematic growth of the motor potential of players of different roles.

The purpose of this study is to determine the effectiveness of the effect of performing differentiated exercises on the development of physical qualities of female basketball players at the beginning of the preparatory training period.

Objectives of the study

1. Theoretically substantiate and develop the content of differentiated sets of exercises in accordance with the primary focus on improving the speed-strength sides of physical qualities, the level of preparedness of female basketball players at the initial training stage.
2. Determine the effectiveness of the management of physical training of students in the training process in the application of differentiated exercises for the development of physical fitness at the initial training stage.

Research methods

Sports training is the process of preparing for the competition. In the competition, everyone wants to win, and the necessary conditions are created at the training. Mastering the technology, improving it and achieving high physical performance are, perhaps, the main tasks of the training. Basketball players include exercises of a different nature in their training. According to the main focus, they can be divided into three groups:

- Exercises for the development of the necessary physical qualities;
- Exercises for learning and improving individual skills in offense and defense;
- Exercises to study and improve the interaction of players in the attack and defense.

When performing a training load, the athlete's body gradually gets used, or, as physiologists say, adapts to it. If all the time to perform the same exercises in the same mode, the body will quickly get used to this load, and the growth of athletic performance will stop. To avoid this, the load should be increased gradually. This can be done in two ways: an increase in the duration of the exercise and an increase in the speed of the exercise.

The success of the basketball team depends largely on the skills of the game in the attack and the defense of each player. Each player must be able to beat the defender in the attack, make a scoring throw and not let his ward score. All methods of attack somehow pursue one goal - to throw the ball into the opponent's basket. If you do not know how to do this, you will weaken the team. Such individual skills in attacking or playing techniques, such as catching and passing the ball, dribbling and throwing into the basket, will allow you to be active on the court. The basis of effective action of the player in the attack is his ability to catch, transfer and dribble. The more mobile you are with the ball, the easier it will be able to create the conditions for a successful basket attack. Exact throws, as a rule, are the result of the player's ability to free himself from the close guardianship of the defender. Fluency in the ball, quick and accurate passes and confident guidance open up good opportunities for you to make successful shots. Each player must understand the relationship of these basic elements of basketball. Transfer and dribble allow the player to own the initiative and keep the defender in suspense (Hakkinen, 1993, pp. 19-20).

The logical relationship of these gaming techniques determines the preferred order of their study and improvement. In parallel with the study and improvement of these game skills in terms of should be provided exercises in running and stopping at full speed and making turns with the ball and without the ball. After mastering the basic gaming techniques of attack should proceed to the study and improvement of protective actions. A good mastery of the methods of attack will allow you to successfully study defensive counteractions. For the same reason, the interaction of players in an attack must be studied earlier than the corresponding defensive countermeasures. Thus, in terms of training it is necessary to provide for the following sequence of training material on basketball: catching and passing, dribbling, moving, stopping and turning; ball throws; personal protection; attack against personal protection; personal protection; attack against zone defense; zone protection (Herrington, 2010, pp. 427-428).

For the implementation of the goals and objectives in scientific work used: analysis of scientific and methodological literature; pedagogical experiment; pedagogical testing; method of statistical processing of the data using computer software Statistics "Excel".

The experiment was conducted in training sessions in the sections on basketball in 2 groups on sports improvement in the Kazakh Academy of Sport and Tourism (12 students in each group were in the control and experimental). In the control group, basketball players were engaged in the course work program, in the experimental one, using specially designed differentiated 116 exercises for developing physical qualities and speed-power orientation (for developing speed, improving hand speed, developing strength and dexterity).

Results

Basketball players of the control group (Table 1) at the beginning of the experiment performed speed-strength tests as in the experimental group, such as a long jump from a standstill, its average was 2.3 m, and at the end of the experiment the result in this test increased to 2.48 m, which is higher by 0.18 cm or 7.83% ($P < 0.05$). In the speed-strength test for endurance such flexion of arms in the support, from a prone position, the result reached - 38.33 times, and by the end of the experiment, the indicator had increased by 7.84 times or by 20.45%. In the test for checking the explosive speed-power qualities determined by the results of the height of the jump up from a place, the level was set at 67.58 cm, and by the end of the mesocycle, the result increased by 6.09 cm or 9, 01% ($P < 0.05$).

Not established in the control group reliable growth indicators ($P < 0.1$) at the end of the experiment in such tests as running from a high start to 6 meters, 20 meters and shuttle running (3 to 10 m).

The data obtained allowed to conclude that in the control group of basketball players' growth was observed only in the exercises of speed-power orientation, and in the manifestation of the maximum speed manifestations of growth, results were not found.

Students of the experimental group (Table 2) improved the results in 5 tests out of 6 used by students in the control.

During the period of our research, speed-strength qualities and speed-speed groups engaged in the experimental group increased in tests: in the long jump from 0.02 m or 2.63% ($P < 0.05$); in the test the flexion of the arms in the support from the prone position increased by a 7.21 times or by 19.16% ($P < 0.01$); the height of the jump is 7.17 cm, which is 13.28% ($P < 0.01$); running from a high start of 20 m - by 0.12 s or 3.85% ($P < 0.05$); in shuttle run (3 x 10 m), the result improved by 1.29 seconds, which corresponded to 15.95% ($P < 0.01$). The result did not change only in the test run at 6m, from a high start.

Table 1. Levels of physical fitness of female basketball players in the control group at the beginning (B) and end (E) of the mesocycle.

No.	Surname, name	Long jump from the spot, m		Bending the arms in a prone position, the number of times		The height of the jump up from the spot, cm		Running from a high start 6 m, with		Running from a high start 20m, with		Shuttle run (3 to 10 m), with	
		B	E	B	E	B	E	B	E	B	E	B	E
1	R.S.	2,43	2,51	41	60	68	76	1,47	1,46	3,30	3,27	7,9	7,8
2	R.D.	2,32	2,39	30	33	53	60	1,50	1,50	3,40	3,38	8,5	8,4
3	S.S.	2,35	2,39	29	30	54	59	1,50	1,50	3,39	3,38	8,4	8,4
4	N.A.	2,45	2,56	42	52	75	80	1,47	1,44	3,31	3,28	7,9	7,9
5	Z. A.	2,25	2,30	38	39	67	73	1,48	1,45	3,35	3,32	8,1	8,0
6	B. F.	2,24	2,31	38	48	65	71	1,49	1,44	3,33	3,33	8,2	8,2
7	K. E.	2,40	2,47	38	38	71	78	1,49	1,44	3,35	3,34	8,1	8,1
8	A. A.	2,38	2,53	41	43	73	80	1,47	1,46	3,29	3,32	7,9	7,9
9	Sh. S.	2,25	2,50	41	51	73	81	1,48	1,45	3,34	3,29	8,1	8,0
10	K.S.	2,38	2,49	38	48	76	80	1,47	1,42	3,32	3,43	8,0	8,0
11	L. S.	2,37	2,46	41	50	69	71	1,48	1,42	3,33	3,34	8,0	8,0
12	I. D.	2,79	2,85	43	62	67	75	1,47	1,46	3,31	3,31	7,9	7,9
	$\overline{X}$	2,3	2,48	38,33	46,17	67,58	73,67	1,48	1,45	3,34	3,33	8,08	8,05
	S	0,15	0,14	4,34	9,93	7,40	7,49	0,02	0,03	0,04	0,05	0,20	0,20
	%		7,83		20,45		9,01		2,03		0,01		0,03
	P		<0,05		<0,01		<0,05	<0,05	<0,05		>0,1		>0,1

Table 2. Levels of physical fitness of female basketball players in the experimental group at the beginning (B) end (E)of the speed-strength mesocycle.

No	Surname,name	Long jump from the spot, m		Flexing the number of times the arms are in a prone position,		Jump height up from the spot, cm		Running from a high start 6m, with		Running from a high start 20m, with		Shuttle run (3 to 10 m), with	
		B	E	B	E	B	E	B	E	B	E	B	E
1	R.S.	2,17	2,28	34	40	65	68	1,38	1,3	3,42	3,0	8,7	9,4
2	R. D.	1,90	1,97	29	36	54	60	1,45	1,4	3,06	2,7	7,9	8,6
3	S.S.	1,79	1,81	26	35	61	67	1,35	1,3	3,20	3,1	8,5	9,7
4	N.A.	2,30	2,36	28	37	75	79	1,41	1,4	2,82	2,7	8,0	9,6
5	Z.A.	1,90	1,97	44	51	61	70	1,42	1,4	3,02	3,0	8,1	9,7
6	B.F.	1,90	1,93	57	60	55	62	1,51	1,5	2,89	2,8	7,9	9,3
7	Kh. E.	1,83	1,84	52	60	49	54	1,61	1,5	3,07	3,0	7,9	8,9
8	A. A.	1,80	1,82	49	57	50	56	1,50	1,4	3,02	3,0	8,0	9,8
9	Sh.S.	1,92	2,01	44	50	50	57	1,35	1,3	3,08	3,1	7,9	9,6
10	K.S.	1,74	1,81	32	46	42	48	1,62	1,5	3,22	3,2	8,2	8,6
11	L. S.	1,75	1,80	24	30	42	50	1,50	1,4	3,33	3,3	8,0	9,8
12	I.D.	1,74	1,81	35	39	44	63	1,48	1,4	3,17	3,0	8,0	9,5
	$\overline{X}$	1, 90	1,95	37,83	45,08	54	61,17	1,47	1,4	3,11	2,99	8,09	9,38
	S	0,17	0,19	11,03	10,39	10,03	8,92	0,09	0,07	0,17	0,18	0,26	0,44
	%		2,63		19,16		13,28		0		3,85		15,95
	P		<0,05		<0,01		<0,05		>0,1		<0,05		<0,01

These studies allow us to conclude about a more significant effective effect of a set of exercises in the experimental group than in the control group and whose increase was in three tests out of six, and in the experimental group in 5 out of 6 tests.

Analysis of the change in the percentage of female basketball players with physical fitness levels above the average is presented in Figure 1. Examination of the increase in physical fitness indicators of female basketball players with values higher than the average showed that the levels of test results in the long jump from the spot, bending the arms in the rest position and height jumps up from a place were above average values at 41,7% - 50% of sportswomen. The percentage of female students with higher than average results has increased significantly, more than 50 percent, only in 2 tests, this is in running from a high start at 20 meters and the results of shuttle running (3 in 10 meters). The number of female students with average values in the test results running from a high start to 6 meters significantly reduced, which allows to state the fact that there was insufficient load in jerk exercises for 6 meters, which was reflected in the absence of a significant increase in results in this test.

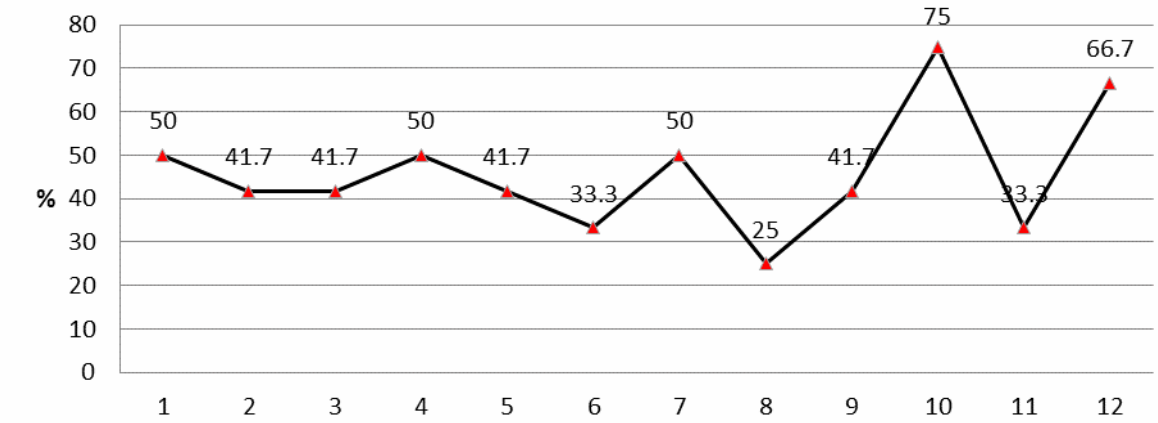

Fig.1. Percentage of female basketball players with physical fitness levels above the average at the end of the speed-strength mesocycle.

Note: 1, 2 - long jump from the spot, m; 3, 4 - bending of the arms in the resting position, number of times; 5, 6 - height of a jump up from a place, cm; 7, 8 - run from a high start 6 m, s; 9, 10 - running from a high start 20m, s; 11, 12 - shuttle run (3 to 10 m).

The uneven changes in the indices of growth of physical fitness, in most of the speed-strength tests we use, can be attributed to the lack of control in the macrocycles of the use of complexes of exercises of speed-strength orientation.

Figure 2 shows the changes in the growth of physical fitness among female basketball players at the end of the experiment in the control and experimental groups. It has been established that the methods of development of speed-strength qualities by exercise complexes of both general and special physical training in practitioners led to an increase in speed-strength indicators for the muscles of the upper limbs and muscles of the body by 19.16% -20.45% and 15.95% in speed endurance.

Table 3 presents the calculations of the correlation coefficient between physical qualities and motor abilities in the experimental group of female basketball players at the end of the experiment. The calculation of the correlation coefficient made it possible to reveal the presence of mutual influences of physical qualities on each other.

Analysis of table 3 showed that at the end of the experiment, the correlation coefficient between the physical qualities of the basketball players had weak links, below the mean values.

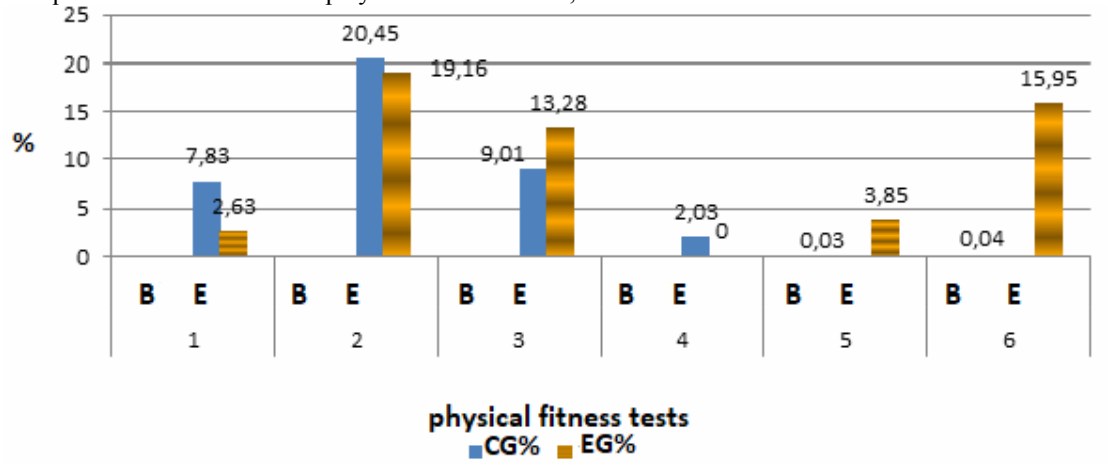

Fig.2. Percentage increase in the level of physical fitness of female basketball players at the end of the experiment in the control (CG) and an experimental group (EG).
Note: 1 - long jump from the spot, m; 2 - flexion, extension of the arms in the prone position, count. time; 3 - height of jump up space, cm; 4 - run from a high start 6 m, s; 5- run from a high start 20 m, s; 6 - shuttle run (3 x 10 m), s. B - at the beginning of the experiment; E- at the end of the experiment.

Table 3. The correlation coefficient between physical qualities and motor abilities in the experimental group of female basketball players at the end of the experiment established in 7 indicators of the 15 calculated correlation coefficients, which accounted for 46.7% of all tests.

	Tests	Bending the arms in a prone position, the number of times	The height of the jump up from the place, cm	Running from a high start 6m, with	Running from a high start 20m, with	Shuttle run (3 to 10 m), with
1	Long jump from the spot, m	-0,179	0,721	-0,339	-0,541	0,093
2	Bending the arms in a prone position, the number of times		-0,202	0,486	-0,129	-0,123
3	The height of the jump up from the place, cm			-0,386	-0,611	0,365
4	Running from a high start 6 m,				-0,134	-0,532
5	Running from a high start 20m,					0,234

Relationships in 5 tests out of 15 or 33.33% were established above the average values, and they were between the long jump from the spot and the height of the jump up from the spot r = 0.721, and with a 20 m run from a high start r = - 0.611; in the tests at 6 meters from a high start and shuttle run, the coefficient was r = - 0.532.

Conclusions

In order to achieve an advantage over an opponent, it is necessary at the right time to accelerate the run or make a rapid and sharp movement with the ball with the help of specific jumps and throws. All technical techniques of basketball perfectly develop reflexes and maintain the muscles of the body in good shape.

People who want to strengthen their health with useful training should pay attention to basketball. Today, the basketball section is one of the most fascinating and accessible for people who want to lead a healthy lifestyle (Rose, 2004).

In order to achieve an advantage over an opponent, it is necessary at the right time to accelerate the run or make a rapid and sharp movement with the ball with the help of specific jumps and throws. All technical techniques of basketball perfectly develop reflexes and maintain the muscles of the body in good shape.

Basketball player jumps the course of the match motivates the athlete to make intense movements in the amount of 40% of the total competition time.

Today, in just one competition, the player runs about 7 kilometers, plus making various jumps, throws and other technical movements (Simmons, 2009). Modern basketball is a rather unpredictable game, so all athletes need to constantly improve various skills, movements, possession skills and master the tactics of the game. Numerous training as practicing special movements make a huge contribution to the development of the general physical fitness of a person, and at the same time strengthen their health (Montgomery, Pyne & Minahan, 2010).

In the study was shown:

1. Implementation of the experimental group of female basketball players for 60 days into the training process of developing speed-strength qualities with exercise complexes of both general and special physical orientation resulted in the experimental group of those involved in the growth of speed-strength indicators for the muscles of the upper limbs and torso muscles by 19.16 - 20.45% and by 15.95% for speed endurance.
2. Assessment of the speed-power qualities of basketball players showed that 41.7% - 50% of female athletes had higher than average values. The percentage of female students with higher than average results has increased significantly, more than 50 percent, only in 2 tests, this is in running from a high start at 20 meters and the results of shuttle running (3 in 10 meters).
3. The decrease in the number of female students with average values in the test results running from a high start to 6 meters allows us to state the fact of insufficient load volumes in exercises for 6 meters from a high start, which was reflected in the absence of a significant increase in results in this test.
4. It has been established that the mesocycle of performing speed-power-oriented exercise complexes by female basketball players at the beginning of the preparatory period is insufficient to cause the development of reliable interrelations in the cerebral cortex between the muscles of the upper and lower extremities and the muscles of the body of the basketball players, as indicated by low correlation coefficients. The correlation coefficient was at the level of average values only between the indicators of speed-power qualities of the muscles of the upper and lower extremities in the jumps in length and height and running for short stretches. and shuttle run.

($r = -0.534$; $r = -0.633$; $r = -0.462$).

The process of playing basketball is full of a large number of special techniques requiring technical and tactical skills, and the emerging spirit of rivalry provides a strong interest to the participants of the match. During the game, a person needs to use different muscle groups to perform complex maneuverability.

Strong basketball movements, running and high jumps, which ensures the full development of the athlete. The dynamic process of the game forces players to use their strength wisely, constantly changing their level of activity (Rose, 2013; Orlan, 2011).

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