Improving the accuracy of various basketball shooting techniques in skilled female basketball players

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Ganieva Fotima Vakhobovna[1]

[1]Uzbekistan state university of physical education and sport, Chirchik, Uzbekistan

Abstract

This study aims to enhance female basketball players' skills in accurately shooting the ball into the basket during gameplay. The main objective of the research is to develop and incorporate into the training process special exercises that reinforce speed, strength, speed-strength abilities, aerobic capacity, isometric and jumping exercises, as well as movements involved in passing and shooting. Throughout the study, the physical fitness levels and shooting accuracy indicators of female basketball players were analyzed, taking into account their playing positions. The results of the conducted pedagogical experiment demonstrated that the developed exercise set positively influences the effectiveness of accurate shooting by female basketball players. The research findings have practical significance in improving the sports training process.

Keywords: female basketball players, playing position, physical fitness, shooting accuracy, speed-strength abilities, specialized exercises.

Introduction

In training athletes for sports games, one of the main goals remains finding effective means and methods to improve the accuracy of technical skills, as increasingly demanding tasks are being set. In world practice of training qualified athletes, the ability to move with the ball on the field and achieve high accuracy in performing technical skills under high pressure from opponents is becoming a crucial factor in successfully resolving game situations. However, the complexity of technical and tactical actions performed by players and the variety of ball-handling situations negatively impact accuracy levels. Currently, as athletes' physical fitness and speed of executing technical skills increase, accuracy in ball-handling movements is becoming increasingly important, since performing technical moves at high game speeds is becoming more challenging for athletes. Qualified female basketball players, in particular, are required to correctly execute complex technical skills and maintain a high ability to shoot accurately throughout the game under defensive pressure. Therefore, improving accuracy techniques using scientifically-based methods is one of the pressing issues in sports training.

Purpose of the study: The aim of the research is to improve the shooting accuracy of 16-17-year-old female basketball players of various positions, taking into account their morphofunctional indicators. The object of the study is the training process of skilled female basketball players of various positions who are students of the Republican School of Olympic Reserve in Tashkent city. The subject of the research is the methodology for developing shooting accuracy in skilled female basketball players of various positions.

Research methods: Analysis of specialized scientific and methodological literature, questionnaire survey, pedagogical testing, pedagogical experiment, anthropometric methods, functional research methods, and mathematical statistical methods. The effectiveness of the developed experimental program for individualizing the technical and tactical preparation of female basketball players was tested within the framework of the main pedagogical experiment during the macrocycle of future competitive activity and through the targeted selection of training means that meet these requirements.

Results and discussion

Results of the study and their discussion: The main set of movement actions in basketball is represented by components such as "attack-defense-counterattack," which are designed to accomplish the ultimate task of effectively executing an accurate shot. Shot accuracy depends on several factors - particularly biomechanical ones, such as the body's ability to maintain balance and stability, the position of the body relative to the weight support area in terms of overall target accuracy (OTA), environmental factors hindering shooting, the athlete's functional state, specifically the level of physical performance, aerobic capabilities, the stage of fatigue, and the menstrual cycle

Table 1. Indicators of physical fitness and shooting accuracy development in center players and tall female basketball players before and after the application of the experimental program

	Pedagogical tests	Players' Playing Position								
			Center players				Tall players			
		M±m	%	t	P	M±m	%	t	P	
1	60m sprint	Before the experiment	8.80±0.1	2.3	2.83	<0.05	8.85±0.2	2.01	2.55	<0.05
		After the experiment	8.6±0.2				8.67±0.1			
2	Standing long jump (cm)	Before the experiment	222.2±2.4	3.2	4.52	<0.05	225±1.5	3.1	5.09	<0.05
		After the experiment	229.2±2.4				232±1.05			
3	Vertical jump (cm)	Before the experiment	42.8±0.1	6.8	4.3	<0.05	43.8±0.1	5.5	3.94	<0.05
		After the experiment	45.7±1.1				46.2±0.2			
4	30m dribbling (sec)	Before the experiment	5.2±0.2	5.8	3.35	<0.05	5.1±0.3	5.9	2.89	<0.05
		After the experiment	4.9±0.2				4.8±0.14			
5	600m run (min:sec)	Before the experiment	2:01.3±6.8	4.7	2.34	<0.05	2:03.1±6.3	4.8	2.54	<0.05
		After the experiment	1:55.6±3.6				1:57.2±3.8			
6	Dominant hand strength - Dynamometry	Before the experiment	37.0±3.6	8.9	2.27	<0.05	36.3±2.9	8.3	2.74	<0.05
		After the experiment	40.3±3.4				39.3±2.9			
7	Barbell test (sec)	Before the experiment	36.2±3.15	8.6	2.55	<0.05	39.6±3.5	49.7	5.77	<0.05
		After the experiment	39.3±2.2				59.3±3.4			
8	Genche test (sec)	Before the experiment	28.0±1.2	6.4	2.96	<0.05	29.0±2.7	55.9	5.24	<0.05
		After the experiment	29.8±1.5				45.2±3.2			

phase. Strength qualities are also of great importance in basketball, as during the game, female basketball players engage in physical struggles for the ball and to maintain position, while all technical and tactical exercises performed also require the manifestation of strength qualities. The strength qualities of the dominant hand were determined through dynamometry. It was established that at the beginning of the experiment, the hand strength of central players was 37.0±3.1 kg, and after the experiment, it increased to 40.3±3.4 kg. For tall players, hand strength at the beginning of the experiment was 36.3±2.9 kg, and at the end of the experiment - 39.3±1.9 kg. The dominant hand strength before the experiment was 34.8±3.2 kg, and after the experiment 37.9±2.1 kg. (Table 1.2) Players of medium height showed high results in speed-related exercises, but their results in strength qualities were low. This fact can be explained by muscle composition. To determine the level of speed-strength qualities development, jumping exercises were used, particularly "standing long jump" and "vertical jump."

In the "standing long jump" test, the results differ slightly among the 4 considered playing positions. Thus, the improvement for center players was 3.2%, for tall players - 3.1%, for forwards - 2.2%, and for guards - 1.9%. Positive changes occurred in the vertical jump test. The growth rate for center players was 6.8%, for tall players - 5.5%, for forwards - 5.3%, and for guards - 4.1%.

The ability to maintain movement coordination was demonstrated in the "30 m

Table 2. Indicators of physical fitness and shooting accuracy development for semi-medium and medium-height female basketball players before and after the application of the experimental program

	Pedagogical tests	Players' position								
		Semi-medium height players				Medium height players				
		M±m	%	t	P	M±m	%	t	P	
1	60 m sprint	Before experiment	8.32±0.2	2.3	2.83	<0.05	8.40±0.1	6.01	3.07	<0.05
		After experiment	8.5±0.1				8.09±0.2			
2	Standing long jump (cm)	Before experiment	223.4±1.0	3.2	4.52	<0.05	220±0.7	1.9	5.42	<0.05
		After experiment	228.4±1.1				224.3±0.7			
3	Vertical jump (cm)	Before experiment	49.0±0.2	6.8	4.3	<0.05	41.4±0.8	5.3	6.15	<0.05
		After experiment	51.0±0.2				43.6±0.8			
4	30 m dribbling (sec)	Before experiment	4.9±0.1	5.8	3.35	<0.05	5.42±0.1	7.7	5.39	<0.05
		After experiment	4.7±0.1				5.0±0.1			
5	600 m run (min, sec)	Before experiment	2.03,5±6.4	4.7	2.34	<0.05	2.04,5±4.1	4.3	2.33	<0.05
		After experiment	1.58,2±1.7				1.59,2±5.9			
6	Dominant hand strength - dynamometry	Before experiment	34.8±3.2	8.9	2.27	<0.05	-35.2±3.05	8.5	2.59	<0.05
		After experiment	-37.9±2.1				-38.2±2.03			
7	Barbell test (sec)	Before experiment	37.3±2.16	8.6	2.55	<0.05	40±3.54	26.3	6.76	<0.05
		After experiment	-39.6±2.1				50.5±3.40			
8	Genche test (sec)	Before experiment	28.3±2.27	6.4	2.96	<0.05	29.1±2.28	39.2	6.08	<0.05
		After experiment	30.7±1.60				40.5±3.25			

dribbling run (s) " exercise. It should be noted that the results of all female basketball players across different playing positions improved in this test. The best improvement was recorded for guards - 7.7%, followed by tall players - 5.9%. The manifestation of general endurance was revealed in the "600 m run" test. Similar positive results were found in the center and tall players, whose improvements were 4.7% and 4.8%, respectively. The achievements of female basketball players in the forward and guard positions were also the same - 4.3% each.

The conducted research revealed the level of general physical fitness of female basketball players in different positions. In the next stage of the study, we conducted research to determine the developmental dynamics of targeted accuracy in female basketball players, the results of which are presented in the tables.

In the tests conducted for the accuracy of throwing movements, it should be noted that female basketball players of all playing positions showed the best results in the tests "Throwing a medicine ball from behind the head while standing, as well as while sitting (m)." The highest results were observed in the test "Throwing a medicine ball from behind the head while standing (m)." For center players, the improvement was 15.4%, for forwards - 13.7%, for guards 12%, and for centers 9.7%. A

Table 3. Indicators of physical fitness and target accuracy development in center players and tall female basketball players before and after the application of the experimental program

	Pedagogical tests	Players' Playing Position							
			Center players				Tall players		
		M±m	%	t	P	M±m	%	t	P
1	Throwing a medicine ball from behind the head while standing (m)	Before the experiment	14.5±0.2	9.7	5.8	<0.05	13.9±0.2	13.7	2.24	<0.05
		After the experiment	15.9±0.1				15.8±0.2			
2	Throwing a medicine ball from behind the head while sitting (cm)	Before the experiment	9.4±0.1	10.6	5.36	<0.05	9.2±0.1	18.5	5.01	<0.05
		After the experiment	10.4±0.1				10.9±0.1			
3	Running up and throwing the basketball into the basket (m)	Before the experiment	43.5±1.5	3.7	2.31	<0.05	40.0±0.2	15.0	5.6	<0.05
		After the experiment	45.1±1.6				46.0±1.2			
4	Accurate shooting from medium distances (points)	Before the experiment	4.5±0.1	8.9	4.94	<0.05	4.6±0.1	4.3	2.83	<0.05
		After the experiment	4.9±0.2				4.8±0.13			
5	Accurate shooting from long distances (points)	Before the experiment	5.0±0.2	10	5.59	<0.05	4.0±0.2	5.1	2.83	<0.05
		After the experiment	5.5±0.2				4.2±0.1			
6	Five free throws from the penalty line for accuracy (sec)	Before the experiment	17.6±0.40	3.4	4.6	<0.05	17.5±0.45	2.3	2.67	<0.05
		After the experiment	17.0±0.10				17.1±0.15			

similar pattern is observed in the "throwing a medicine ball from behind the head while sitting (cm) " test. The results of this test show that the highest improvement - 18.5% was found in tall players, followed by 14.7% in forwards, 13.7% in guards, and 10.6% in center players.

In the "Running up and throwing the basketball into the basket (m) " test, high values of speed-strength quality development were observed in two playing positions - tall players and semi-middleweight players. The increase in this quality was 15% for tall players and 13.4% for semi-middleweight players. Center players lagged significantly behind, with their growth at 3.7%, while for middleweight players it was even lower at 2.2%. In the accuracy test "Throwing a basketball from medium distances," the highest accuracy from medium distances was established for center players at 8.9%, followed by tall players with an increase of 7.5%, semi-middleweight players with a slightly lower result of 7.1%, and tall players with a 4.3% increase.

In the "Long-distance accuracy shooting" tests, the best results were again observed in center players, with an increase of 10%, meaning the positive results in this test were the same as in the "Mid-range accuracy shooting" test. Tall players also showed good results, with an increase in accuracy quality of 8.3%. Semi-tall players experienced a 7.7% increase, and finally, tall players reached 5.01%. In the "Free throw accuracy shooting 5 times from the penalty line" test, the growth results turned out to be insignificant, amounting to 3.4% for center players, 2.3% for tall players, while the worst results were recorded for tall and semi-tall players, amounting to only 1.7%.

Conclusion

Table 4. Indicators of physical fitness and shooting accuracy development in female basketball players of medium and intermediate height before and after the application of the experimental program

	Pedagogical tests	Players' Playing Position								
			Medium-height players				Intermediate-height Players			
		M±m	%	t	P	M±m	%	t	P	
1	Throwing a medicine ball from behind the head while standing (m)	Before the experiment	13.00±0.1	15.4	4.72	<0.05	14.2±0.1	12	5.01	<0.05
		After the experiment	15.0±0.1				15.9±0.1			
2	Throwing a medicine ball from behind the head while sitting (m)	Before the experiment	9.5±0.2	14.7	3.28	<0.05	10.2±0.2	13.7	4.28	<0.05
		After the experiment	10.9±0.3				11.6±0.3			
3	Running and throwing a basketball into the basket (m)	Before the experiment	38.8±1.3	13.4	5.61	<0.05	41.1±1.0	2.2	2.73	<0.05
		After the experiment	44.0±1.4				42.0±0.3			
4	Mid-range shooting accuracy (points)	Before the experiment	4.2±0.3	7.1	2.9	<0.05	4.0±0.3	7.5	2.63	<0.05
		After the experiment	4.5±0.13				4.3±0.2			
5	Long-range shooting accuracy (points)	Before the experiment	3.9±0.4	7.7	2.24	<0.05	3.6±0.1	8.3	4.71	<0.05
		After the experiment	4.2±0.14				3.9±0.1			
6	Five free throws from the free-throw line for accuracy (sec)	Before the experiment	17.5±0.1	1.7	3.71	<0.05	17.6±0.39	1.7	2.36	<0.05
		After the experiment	17.2±0.1				17.3±0.1			

Improving the accuracy of shooting the ball into the basket using various methods for skilled female basketball players requires a comprehensive approach. When technical, physical, and psychological exercises are used in combination, the result is much more effective. Regular use of a set of special exercises helps to increase accuracy, improve game effectiveness, and fully demonstrate the athlete's potential. The results indicate that when female basketball players use a specialized set of exercises and equipment, their shooting movements demonstrate high accuracy and have reached a level of automaticity. However, differences in shooting values were observed depending on the players' positions on the court.

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AUTHOR BIOGRAPHY:



Fotima Vakhabovna GANIEVA

Employment
Docent at Uzbekistan state university of physical education and sports

Degree
MD

Research interests
Basketball, physical education and sport, Theory of physical education, Analyzing of sport competitions