

## **DYNAMICS OF SPECIFIC MOTOR SKILLS AND ABILITIES IN 14-15 YEARS OLD VOLLEYBALL PLAYERS**

*(Preliminary communication)*

**Vladimir Kotev**

*National Sports Academy "Vassil Levski", Sofia, Bulgaria*

### **Abstract**

*This paper aims to provide information for the development of specific motor skills and abilities of 14-15 years old volleyball players under the influence of a program of physical training, including exercises with its own weight. Testing is performed twice on 15 volleyball players of CSKA, which includes six indicators. The study was conducted at the beginning and in the end of the preparatory period: August 2014. - October 2014. A comparative analysis of their results, the correctness of the resulting differences between the two surveys was checked using Student's t-criterion for dependent samples. Resulting differences provide guidance for optimizing the educational and training process in volleyball and information on the effectiveness of the work.*

**Keywords:** *physical training, volleyball's educational and training process, young volleyball players, Pared samples test, motor tests, experimental program*

### **INTRODUCTION**

Volleyball is a non-cyclic sport. "Here the movements are distinguished with great variety of spatial, time and power characteristics" (Zhelyazkov (Желязков), 1981). These characteristics, however, are too limited. After three contacts with the ball, you have to proceed to an attack or a defense. In the meantime every contact with the ball is very short – within a tenth of the second.

Volleyball is characterized by a variety of motor habits and game actions which differ by intensity and coordination structure. This contributes to the development and the perfection of the main physical qualities (Kotev, 2015).

Sports teachers should know very well the age of the child's body and continuously to improve their professional training. The teachers should take into account all anatomic and physiological as well as psychological characteristics of adolescents (Антонова, 2009).

The development of the motor skills of adolescents must be in accordance with the changes happening in their bodies and with their abilities (Antonova (Алипиева), 1971; Rachev (Рачев), 1983; Dimitrova (Димитрова), 1999; Nikolova (Николова), 2002; Mavrudieva (Маврудиева), 2006; Doncheva (Дончева), 2007).

A number of authors have worked on the volleyball issues (Mihaylov (Михайлов), 1995); Antonov (Антонов), (2007); Dimitrova (Димитрова), 2000; Dimitrov

(Димитров), 2005; Bozhilov, (Божилов), 2008).

*The purpose of the study* was to trace the development of specific motor skills and volleyball qualities at the age of 15 years, under the influence of an experimental program of physical training.

*The object of this study* is the training process in adolescents' volleyball.

*The study focused* on the peculiarities of the development of motor skills at 14-15 years old volleyball players.

*Contingent of the study* are 15 competitors aged 14-15 years practicing volleyball in VC CSKA Sofia (Sofia).

### **METHODS**

*Organization and methodology* of the study include the following stages:

1. *Sports and pedagogical testing of players* – the battery test includes 6 test track dynamics of specific motor skills of volleyball. For the purposes of the study, the volleyball players were tested twice - at the beginning and at the end of the preparatory period (August '2014 – October '2014). During this period of the training of CSKA volleyball players is applied an experimental program of physical training, including CrossFit exercises with their own weight.

The data were processed by the following mathematical and statistical methods:

- Descriptive analysis;

Table 1. Studied indicators

Indicators	Measure	Accuracy of measurement	Increase direction
Vertical jump	cm	1,00	+
Jump with pace	cm	1,00	+
Crunches for 30 seconds	reps	1,00	+
Jumps to a certain height in 30 seconds	reps	1,00	+
Special speed	sec	0,01	-
Speed-strength endurance	sec	0,01	-

- Comparative Student's t-test for dependent samples, at a high guarantee probability  $P_t \geq 95\%$ .

## RESULTS AND DISCUSSION

Compared to the average level of the studied signs of volleyball players in the first and second testing, thereby tracking the changes occurring under the influence of experimental work done. The resulting differences in average levels between the two surveys were checked for statistical reliability using comparative Student's t-criterion for dependent samples at high guaranteed probability  $P_t > 95\%$ .

Table 2. and 3. presented the results of the volleyball players study group, giving information on the level of their specific motor skills. The first of these are the results of volleyball players at the beginning of our study, and the second - their achievements after the two held training processes.

When comparing the indicator №1 "Vertical jump" it is seen that at the end of the study the results are significantly higher. Average group has improved its performance by 3.47 cm, as early  $X_1=36.40$  cm, while  $X_2=39.87$ cm. The maximum achievement in the first study was 45 cm, and the second – 50 cm. Work during the preparatory period has significantly increased the explosive force of lower limbs and jumping skills of the competitors.

The results at the end of the study on "vertical jump after stepping" also have risen. It is seen a great growth even at the minimum values. The weakest performance in the first testing is  $X_{min}=28$  cm, and the second –  $X_{min}=34$  cm. The difference of 6 cm. undeniably proves the positive impact of the work on explosive power of the lower limbs of volleyball. The average score in the beginning  $X_1=41.40$  cm. And at the end  $X_2=45.73$  cm.

These two tests that are specific to volleyball prove

the positive effect of training work and proper guidance of the training of the athletes to increase the specific explosive force of their legs and jump skills.

Next motor quality, which aims to work for the physical training of youth volleyball players, is the explosive power of the abdominal muscles. In volleyball, it is an important factor in the performance of some of the basic elements of the game - a kick-in and the knock. Information about its level gives the test "crunches for 30 seconds".

At the beginning of the study the average of the results for this indicator is  $X_1=24.20$  reps. The minimum number of sit-ups made for the allotted time  $X_{min}=16$  reps. And the maximum  $X_{max}=29$ . At the end of the preparatory period volleyball showed significantly better results –  $X_{min}=24$  reps  $X_{max}=35$  reps. The average value of the group is  $X_2=30,13$ reps. The results clearly show that the attached program has had a positive development of the explosive power of the abdominal muscles, which should lead to an improvement of certain elements of the art of the game, as the initial shock and crash.

Another important quality for the volleyball players motoric is jumping endurance. Measured by test "jumps to a certain height in 30 seconds," it gives us information as jumping skills of the volleyball players and the speed of the nerve impulse muscle.

In the study group of CSKA volleyball team players the initial average was  $X_1=51.67$  reps and at the end  $X_2=62.27$  reps. In this test impresses the big difference in peak values between the two studies - initially  $X_{max}=59$  reps. While the end result is maximum  $X_{max}=78$  reps. The training work and characteristic of this dynamic age physical development have contributed to the large growth of the results at the end of the study.

Table 2. Descriptive statistics – first testing (August '2014)

Indicators	R	Min	Max	Mean	S	V	As	Ex
Vertical jump	19	26	45	36,40	4,97	13,65	-0,34	-0,05
Jump with pace	22	28	50	41,40	5,32	12,84	-1,18	2,27
Special speed	13	16	29	24,20	2,93	12,12	-1,42	2,89
Crunches for 30 seconds	19	40	59	51,67	4,79	9,27	-0,86	1,55
Jumps to a certain height in 30 seconds	4,26	24,32	28,58	26,04	1,37	5,25	0,77	-0,49
Speed-strength endurance	15,48	72,68	88,16	78,26	4,45	5,69	0,84	0,11

Table 3. Descriptive statistics – second testing (October'2014)

Indicators	R	Min	Max	Mean	S	V	As	Ex
Vertical jump	21	29	50	39,87	5,87	14,71	0,04	-0,63
Jump with pace	21	34	55	45,73	5,62	12,30	-0,12	0,24
Crunches for 30 seconds	11	24	35	30,13	3,23	10,71	-0,18	-0,74
Jumps to a certain height in 30 seconds	28	50	78	62,27	8,61	13,82	0,37	-1,10
Special speed	5,23	20,73	25,96	23,34	1,64	7,04	0,20	-0,74
Speed-strength endurance	18,42	63,55	81,97	72,01	5,53	7,69	0,27	-0,65

Table 4. Credibility of growth results.

Indicators	I testing		II testing		d	d %	t	P(t)
	Mean	S	Mean	S				
Vertical jump	36,40	4,97	39,87	5,87	3,47	9,53	4,38	99,94
Jump with pace	41,40	5,32	45,73	5,62	4,33	10,46	5,48	99,99
Crunches for 30 seconds	24,20	2,93	30,13	3,23	5,93	24,50	5,34	99,99
Jumps to a certain height in 30 seconds	51,67	4,79	62,27	8,61	10,60	20,51	4,35	99,93
Special speed	26,04	1,37	23,34	1,64	-2,70	-10,37	9,08	100,00
Speed-strength endurance	78,26	4,45	72,01	5,53	-6,25	-7,99	6,73	100,00

The special speed of the surveyed players is also positively influenced by the experimental training loads. There is an average growth of results with 2.70 sec. In the first testing average performance is  $X_1=26.04$  sec., and the second testing –  $X_2=23.34$  sec. After a two-month training it impacts greatly and increase the minimum as well as the maximum score of volleyball.

The last line of the analysis is in terms of speed-strength endurance. In our study, it is measured using special speed test which was calculated as the sum of three tests of volleyball. This yields information about their level of speed-strength endurance and speed-recreational processes. It is seen that the difference between the first and second testing is significant. At the end of the study the adolescent volleyball players show better results in an average of 6.25 sec. The best achievement is  $X_{max}=63,55$  sec., And the weakest  $X_{min}=81.97$  sec. It could say that the training is equally taking effect on all players, when each of them has grown results with about 6 seconds.

The existence of differences between the average levels of both studies, in itself, not sufficient to make serious conclusions before being checked their importance. For this purpose is attached comparative t-Student test for dependent samples, with high probability warranty  $P_t \geq 95\%$ .

Comparing the obtained values of the t-critical criteria with the sample, which in this case is  $t_{\alpha}=2.15$  we found that by all investigated indicators the alternative hypothesis has been confirmed (Table 4.). The empirical values of criteria (temp) ranged from 4.35 to 9.08. High guarantee probability ( $P_t \geq 95\%$ ) can be argued that the resulting differences at the end of our study are statistically significant and demonstrate the effectiveness of ex-

perimentation of our program for physical training. Implementation and training with adolescent's 14-15 years old volleyball players positively influence toward our study signs. There is a significant growth of volleyball results regarding explosive power of the lower limbs and abdominal muscles, special speed of movement, speed – power and jumping endurance.

## CONCLUSIONS

1. Descriptive statistics and results at the end of our study show a positive development of specific motor skills and abilities of volleyball competitors.

2. Applications in the physical training of 14-15 year volleyball players' exercises with own weight significantly improves their speed, power and jumping endurance, speed and special explosive power of the abdominal muscles and legs.

3. The calculation of the Student's t-criterion for dependent samples proved that any changes occurred as a result of the impact of the specialized training program are significant and supported with high probability warranty. Its implementation has led to significant growth of the tested indicators.

4. We recommend that when working on physical training of the youth volleyball players to include the Cross Fit exercises with its own weight, since their effectiveness is proven and reliable.

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Correspondence:

Vladimir Kotev

National Sports Academy " Vasil Levski "

Studentski grad, 1700, Sofia, Bulgaria

E-mail: vlado\_kotev@abv.bg