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SPORTS-PEDAGOGICAL TESTING AS A CONTROL METHOD FOR MEASURING THE SPECIFIC EFFICIENCY WITH 10-12-YEAR-OLD VOLLEYBALL PLAYERS

Preliminary communication

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Abstract

The topic of the present study is related exactly to this significant issue with the aim of increasing the sports achievements, emphasizing on the physical development and specific physical preparation, namely the bouncing speed, with 10-12-year-old volleyball players. Contingent of the research is 56 boys aged between 10 and 12 years, practicing volleyball in sports clubs in three different regions in Bulgaria – Sofia, Plovdiv and Kurdjali, at VC Lulin, VC Victoria and VC Arda, respectively. In order to realize the overall research we used the following scientific-research methods: Anthropometrics – to reveal the state of basic anthropometric traits through collecting information along 3 indexes. Body Mass Index – BMI will be calculated, which is recommended by the International Health Organization and gives an idea of the degree of obesity of the researched individuals. The researched sample is highly homogeneous along two of the surveyed indexes (height and weight), and along all the other indexes it is relatively homogeneous. As regards the coefficients of asymmetry and excess, six out of eight indexes have symmetrical distributions and normal excess. On the base of the claim of the sports science and volleyball experts that the age 10-12 years is sensitive for development of the motor quality speed, we arrived at the conclusion that applying the testing battery measuring the bouncing speed with 10-12-year-old volleyball players will help the quality of the education-training process.

Keywords: *volleyball players, children's physical development, bouncing speed, anthropometric measurements, Body Mass Index, sports-pedagogical testing, education-training process, sports achievements, analysis of variance*

INTRODUCTION

The intensification in sport in 21st century sets new issues to the scientific experts. The optimization of the means, methods, and contents of the education-training process with young athletes is in the base of the scientific research in the field, as well as the control of the specific efficiency is becoming much more valuable asset for the sports specialists.

Volleyball game and its place in the cultural life of society has always been a subject of aesthetic, social, and commercial interest ever since its invention in 1895 (Hristova & Serafimova (Христова & Серафимова), 2015)**.**

Today volleyball is an interesting game with variable character which requires the performance of complicated motor actions both in time and space. The variety of movements engages the entire locomotor system and stimulates the thinking (Lazarova (Лазарова), 2013).

In order to meet the rather intense development and perfection of all components, the Olympic discipline sets high requirements to the personal qualities and specific efficiency of the growing-ups, outlining the prospects for their future development in the elite sport.

The sports practice definitely disproves the existence of a limit to human abilities (Zhelyazkov & Dasheva (Желязков & Дашева), 2011).

This is the base of one of the major problems of the modern scientific research in the field of sport – the optimization of the means, methods, and the basic contents of the education-training process of the young athletes. The issue about the control, evaluation, and optimization of the sports training is extremely important, but because of its great complexity it has been solved on a different level both in the different countries and in the different kinds of sports.

We consider that applying sports-pedagogical testing as a control method for measuring the specific efficiency with 10-12-year-old volleyball players would add to revealing the existing sources for improvement in the management of the education-training process with the growing-ups.

In our opinion, the expected results, arising from the nature of the applied scientific approach and the researched contingent, are a valuable asset for the sports specialists and they would be able to organize the training cycles in the different periods of training young athletes more effectively.

The aim of the present study is to establish the physical development and specific physical preparation of 10-12-year-old volleyball players.

In order to fulfill the aim we set the following ***tasks***:

- To establish the level of major anthropometric indexes.
- To establish the level of specific physical preparation, namely the bouncing speed, as form of manifestation of the motor quality speed.

METHODS

Contingent of the research is 56 boys aged between 10 and 12 years, practicing volleyball in sports clubs in three

Table 1. Anthropometric and sport - pedagogical indicators

	Indexes	Units	Precision of measurement	Direction of increase
1.	Height	cm	1	+
2.	Body mass (weight)	kg	1	+/-
3.	Height – extended arm /extending/	cm	1	+
4.	BMI	Indexes	0,01	+/-
5.	Forward bounces with two feet	sec	0,01	-
6.	Zigzag bounces with one foot	sec	0,01	-
7.	Two forward and one backward bounces	sec	0,01	-
8.	Hopscotch bounces	Number	1	+

different regions in Bulgaria – Sofia, Plovdiv and Kurdjali, at VC Lulin, VC Victoria, and VC Arda, respectively.

In order to realize the overall research we used the following scientific-research *methods*:

- Literature review (including Internet research). 11 literature sources were reviewed concerning sports training issues, physical development, and specific efficiency with growing-up athletes.

- Anthropometrics – to reveal the state of basic anthropometric traits through collecting information along 3 indexes. The measurements were made with standard devises and standard methods.

For a more exhaustive characteristic of the physical development the so called Body Mass Index – BMI will be calculated, which is recommended by the International Health Organization and gives an idea of the degree of obesity of the researched individuals.

- Sports-pedagogical testing – in order to reveal the state of major morph-functional traits and to establish the level of development of the specific physical preparation (namely the bouncing speed as a form of manifestation of the motor quality speed) 8 indexes were reviewed, divided into two major groups depending on the kind of information they provide:

The first group includes 4 indexes – three anthropometric (from №1 to №3) and Body Mass Index – BMI (№4)

- The second group includes 4 indexes for bouncing speed (from №5 to №8).

Analysis of variance – for establishing the mean levels (X) and the variety of the researched indexes of each of the researched samples (S and V%).

The applied indicators (anthropometry, body mass index - BMI, sports and pedagogical tests) are presented by Table 1. The description of the indicators is within the author of the study.

RESULTS

The analysis of variance allows revealing the average level and the variation of the traits of physical development and special physical preparation of the researched individuals.

The dispersion of the indexes is presented in Table 2.

When analyzing the results *(Table 2.)* we found out there is a slight dispersion of the values with 2 of the surveyed traits (height and extending) – the sample is highly homogeneous (V<10%), and along all the other traits the coefficient of variation is within 10-30%, i.e. the sample is relatively homogeneous (the extent of variance is average). As regards the coefficients of asymmetry (As) and excess (Ex) at significance level α=0.05, describing the symmetry and height of the peak of the distribution, six of the indexes do not exceed the critical values (№1, 3, 4, 5, 6 and 8), i.e. the distribution is symmetrical and has a normal excess. With the „Body mass /weight/" index there is an asymmetrical distribution of the values AS>0.643, and with the index „Two forward and one backward bounces" the height of the peak does not have a normal distribution Ex>1.267.

Table 2. show that as regards the index "Height /standing/" the range of variation is 43 cm, with the highest value being 180 cm, and the lowest - 137 cm. The average arithmetical (X) shows that the average value of the researched sample for the index Height is 156.41 cm.

As regards the „Body mass /weight/" index the range of variation is 46 kg, the heaviest boy weighing 76 kg, and the lightest – 30 kg. The average arithmetical shows that the 10-12-year-old volleyball players have an average body mass 47.25 kg. There is an asymmetrical distribution of the values with this index - AS>0.643.

As regards the index "Height – extended arm /extending/" the range of variation is 52 cm, the highest value being 232 cm, and the lowest - 180 cm. The average arithmetical shows that the growing-ups reach 201.86 cm with an extended arm upwards.

The analysis of the values along the index "Body Mass Index /BMI/" (*Table 2.*) shows that the average body mass index with 10-12-year-old volleyball players is BMI=19.2, i.e. the surveyed sample is characterized with a normal level of obesity according to the table for the growing-up boys of the International Health Organization *(Table 2.)*. BMI=26.4 is the highest value along this index, digressing significantly from the center by 50% of the cases (above the values for normal obesity for the particular age group), BMI=13.84 is the lowest value (below the values for normal obesity).

The analysis of the results regarding the bouncing speed *(Table 2.)* shows that the achievements of the growing-ups vary between:

- 6.04 – 9.22 sec (X=7.39 sec) along the index „Forward bounces with two feet";
- 5.6 – 9.19 sec (X=7.09 sec) along the index „Zigzag bounces with one foot";
- 7.59 – 14.34 sec (X=10.96 sec) along the index „Two forward and one backward bounces";
- 17 – 39 (X=28.53) along the index „Hopscotch bounces".

In this group of indexes, providing information about the bouncing speed, as a form of manifestation of the motor quality speed, an exception of the normal distribution for the height of the peak is only the index "Two forward and one backward bounces" with higher than the critical value for the coefficient of excess (Ex>1.267).

Table 2. *Mean values and variation of traits of all surveyed indexes*

N	Variables	X min	Xmax	R	X	S	V	As	Ex
1.	Height	137	180	43	156,41	10,07	6,44	0,302	-0,684
2.	Weight	30	76	46	47,25	10,22	21,62	0,76*	0,408
3.	Extending	180	232	52	201,86	12,62	6,25	0,293	-0,668
4.	BMI	13,84	26,4	12,56	19,21	3,12	16,22	0,611	-0,092
5.	2 feet forward	6,04	9,22	3,18	7,39	0,89	11,99	0,497	-0,726
6.	Zigzag	5,6	9,19	3,59	7,09	0,84	11,85	0,062	-0,533
7.	2 forward 1 backward	7,59	14,34	6,75	10,96	2,14	19,52	0,104	-1,443 *
8.	Hopscotch	17	39	22	28,53	4,68	16,40	0,324	0,045

CONCLUSIONS

- The researched sample is highly homogeneous along two of the surveyed indexes (height and weight), and along all the other indexes it is relatively homogeneous.
- As regards the coefficients of asymmetry and excess, six out of eight indexes have symmetrical distributions and normal excess.
- The mean values of the indexes of the physical development with 10-12-year-old volleyball players are the following: Height = 156.41 cm; Weight = 47.25 kg; Extending = 201.86 cm; BMI = 19.21.
- The mean values of the special physical preparation, namely the indexes for bouncing speed, are the following: Forward bounces with two feet = 7.39 sec; Zigzag bounces with one foot = 7.09 sec; Two forward and one backward bounces = 10.96 sec; Hopscotch bounces = 28.53.
- On the base of the claim of the sports science and volleyball experts that the age 10-12 years is sensitive for development of the motor quality speed, we arrived at the conclusion that applying the testing battery measuring the bouncing speed with 10-12-year-old volleyball players will help the quality of the education-training process.

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