COMPARATIVE ANALYSIS AND EVALUATION OF THE PHYSICAL DEVELOPMENT AND SPECIFIC PREPAREDNESS OF COMING UP GIRL BASKETBALL PLAYERS

Mariana Borukova

National Sports Academy "Vassil Levski", Sofia, Bulgaria

ABSTRACT

Basketball is a collective sport where physical data and the level of physical qualities development are particularly important for practicing the game and reaching higher level of technical and tactical preparedness. The purpose of the present study is the optimization of the training process of coming girl basketball players by comparative analysis and evaluation of their physical development and specific workability. The duration of the study is within one sport-competitive year. Physical development and specific workability of coming girl basketball players are the subject of the study. The basic signs of the physical and technical-tactical preparedness in basketball are the object of the paper. Contingent of the study are 14 girl competitors from "Slavia" basketball club, girls'14. All girl competitors went under a test by 25 indicators for the needs of the study. The following methods are applied for the purpose set and the tasks of the study: review study of the specific literature, 9 anthropometry tests, 16 sport-pedagogical tests. The following mathematic-statistical methods are applied: variation analysis, index of the body mass, method of sigma deviations and comparative t criterion of Student for dependable extracts.

For this age group the explosive strength of the lower limbs under vertical efforts, the speed of movement along the ground without a ball and movement in defense has the highest level of development. Statistically important difference is observed for the signs related to the speed of movement along the ground with a ball, the index of leading the ball and the realization skills but only in two positions.

Key words: *evaluation, coming up girl basketball players, basketball, sports preparedness*

INTRODUCTION

Basketball is a collective sport where the physical data and level of physical qualities development are particularly important for its practicing and reaching higher level of technical and tactical preparedness.

The follow up of the development level of the physical development, motive preparedness and technical-tactical skills basic signs of the young girl basketball players allow the successful management of the school and training process and the quicker achievement of the sports mastership level.

One of the latest studies made by a scientific team (R. Tsarova and M. Borukova) during the period 2012-2015 of 12-19-year-old girl basketball players established that the present daygirl basketball players have much lower results in comparison with the prior generations. The results tend to become lower with each past year.

The age of 14-15 years is a key one for the development of the young girls as competitors. They are in

a period of sports development and it is important that the school and training process is directed to the development and perfection both of the individual abilities and qualities and the group actions, team interactions and game effectiveness (in attack and defense).

The study of the specific literature gives the reason to formulate the following working hypothesis for our research: The education and perfection of the young girl basketball players is a complicated and prolong process. The successful management of that process requires permanent scientific research for establishing the state of the physical development and specific workability basic signs of each one of the players. The analysis of the research results of "Slavia" BC coming up girl basketball players' team (14-16-year-old) will allow to disclose both the strong and weak sides of their preparation and on that base to define the accents about their future school and training work.

METHODOLOGY

Purpose of the present research is the optimization of the training process of coming up girl basketball players by comparative analysis and evaluation of their physical development and specific workability. The present study was made during two sport competitive years.

Subject of the research are the physical development and specific workability of coming up girl basketball players.

Object of the study are the physical and technical-tactical preparedness basic signs in basketball. Studies are 14 girl competitors from "Slavia" BC.

Applied are the following *methods of research* for

the realization of the purpose and tasks of the study:

1. *Review study and theoretical analysis of specific literature* – for establishing the state of the problem under study according to literature data.

2. *Anthropometry* – for disclosing the state of the basic anthropometric signs by collecting information about 5 indicators (Table 1). The measurements are made by standard devices and standard methodology (Slanchev, 1998).

3. *Sport-pedagogical tests* – for establishing the level of the specific physical and specific technical-tactical preparedness of the girl basketball players under study. Applied are 16 tests divided into two groups as follows (see Table 1).

Table 1. List of indicators

№	Indicators / Parameters	Measurm. units	Exactness of the measurm	Direction of increase
1.	Height	cm	1,0	+
2.	Weight	kg	0,1	+
3.	Body Mass Index	kg/m ²	0,01	
4.	Length of lower limb	cm	1,0	+
5.	Length of upper limb	cm	1,0	+
6.	Span length	cm	1,0	+
7.	Chest measurement – pause	cm	1,0	+
8.	Chest measurement – breathing difference	cm	1,0	+
9.	Stretch (horizontal)	cm	1,0	+
10.	20m sprint run	s	0,01	-
11.	Run b/n stands	s	0,01	-
12.	112m "Shuttle" run	s	0,01	-
13.	Vertical jump	cm	1,0	+
14.	Long jump	m	0,01	+
15.	Throwing compact ball while seated – forward	m	0,01	+
16.	Moving in defense	s	0,01	-
17.	Raising up from cervical lying (abdominal press)	pcs	1,0	+
18.	Loops by dribble while standing at site	pcs	1,0	+
19.	Dribble between stands	s	0,01	-
20.	Leading the ball index	s	0,01	-
21.	Speed shot while moving – time	s	0,01	-
22.	Speed shot while moving – pcs			+
23.	Speed shot while moving – coefficient	s	0,01	-
24.	Shooting from position	pcs	1,0	+
25.	Free throws - % of successful ones	%	0,01	+

The results of the study have been subjected to *mathematical-statistical* procession by: *variation ana-*

lysis, Index method, comparative t-criterion of Student for dependent extract.

RESULTS

The variation analysis applied allows the disclosure of the average level and dispersal of the indicators under study.

In order to solve the purpose and the tasks of the research, we have made comparative analysis of the results from two sport-pedagogical tests of "Slavia" basketball team. During the first study, the girls are

14-year-old while during the second one, they are 16-year-old.

Figure 1 presents comparative analysis of the average values of all physical development indicators under study. The analysis of the figure shows that all signs values are higher during the second research.

Figure 1. Comparative analysis of the average values of the physical development indicators

Observed are about 3.5 cm higher height, around 7 kg difference and higher values for all measured lengths of the body. We think it normal, as during the second research the girls are 16 year old and their sex development has come to an end; they are in the second phase of their puberty development – a phase of physical maturing when adipose does not increase, the increase of the body mass is due to the increase of the muscle tissue which may be 32,6% from the body's weight. During that period, the proportions of the body are formed as the ones they will be in mature age.

The variation analysis applied shows that for both researches the quantitative indicators have normal distribution, which give us the possibility to apply comparative analysis by Student criterion for dependable extracts. It is important for us to establish whether there are differences in relation to the degree of homogeneousness of the group for the physical development signs because girls' age between 14 and 16 is of exceptional importance for the basketball game.

Anyway, the differences between the average levels of the signs under study during both researches do not give us the right to make serious conclusions before the reliability of these differences is not checked up. For the purpose, we have applied the t-criterion of Student. Critical value of the two compared totalities for dependent extracts at a guaranteed probability $P \geq 95$ e $t = 2,16$. The analysis to the results shows that for two of indicators only, the t-criterion values are higher than the critical value indicated. Consequently, the differences existing in relation to these two signs (lower limb length – $t = 2,32$ and the horizontal stretch – $t = 2,57$), are statistically reliable which is supported by 95% guarantee probability. As far as the other signs under study are concerned, the differences can be explained by occasional reasons.

Figure 2 presents the comparative analysis of the average values of all physical preparedness indicators under study.

Figure 2. Comparative analysis of the average values of the physical preparedness signs

The analysis of the figure shows that better values are observed for the speed of movement ("run between stands", "Shuttle run", "moving in defense"), for the explosive strength of lower and upper limbs. It is only in relation to the abdominal muscles strength that the average ones have close values. The importance of the differences of the physical preparedness average values is presented on fig. 3.

The analysis shows that from the eight indicators listed here, only for two of them the t-criterion values are higher than the critical one ($t_{emp}=2,16$), while all the rest are of lower values. These are the signs related to the speed of moving along the ground without a ball ($t_{11}=3,62$) and the speed endurance ($t_{12}=7,55$).

Figure 3. Importance of the differences between the average values of the physical development signs

The differences between both mathematic mean values of both researches for the respective signs under study are sufficiently great and can be considered for important. Consequently, it can be ge-

neralized that considerable improvement is observed for the young girl basketball players' speed of movement along the basketball ground and of the speed endurance.

Figure 4 presents the comparative analysis of the average values for all technical-tactical preparedness signs under study.

Figure 4. Comparative analysis of the average values of the technical-tactical preparedness indicators

The analysis of fig. 4 shows that during the second research, the average values of most of the signs are higher. It is only for the indicators related to the

strength of the abdominal muscles and the speed of made a basket, the average values during the second research are a little bit lower.

Figure 5. Importance of the differences between the average levels of the technical-tactical preparedness signs

The analysis of fig. 5 shows that from the ten indicators listed here, for four of them, the t-criterion values are higher than the critical one

($t_{emp}=2,16$), while all the rest are of lower values. These are the signs related to the leading the ball at high speed ($t_{19}=2,99$), respectively the index of

leading the ball ($t_{20}=13,99$), as well as the realization skills, but from two positions only – from 45° ($t_{24}=2,38$) and 90° ($t_{24}=2,61$). For the needs of the study and with the purpose to get more detailed information, the shot from a position was processed according to the separate shooting positions from 0° , 45° и 90° . Consequently, we could say that the differences between the mathematic mean values of the respective signs under study are sufficiently great for both researches and can be considered as important. That gives us the reason, with high guarantee probability ($P \geq 95\%$) to state that “Slavia” girl basketball players have considerably improved their abilities to work with the ball at high speed and their realization skills in two positions only – respectively from 45° and from 90° ; the differences for all the rest of the signs can be explained by occasional reasons.

The analysis and the generalizations made allow formulating the following *conclusions* that are more important:

1. For both researches, the group is homogeneous and relatively homogeneous in relation to the physical development and specific workability signs under study.
2. Statistically important difference is observed for the signs related to:
 - ✓ speed of moving along the basketball ground with a ball ($t_{19}=2,99$), and respectively the index of leading the ball ($t_{20}=13,99$) and
 - ✓ the realization skills but from two positions only – from 45° ($t_{24}=2,38$) and 90° ($t_{24}=2,61$).

DISCUSSION

For a period of two sport competitive years, “Slavia” cadet’16 girl team has worked on a specific methodology developed by their coach Silvia Peeva. The methodology is directed to priority development of the speed abilities, improvement of the technical skills, as well as to the development of the girl competitors’ strength abilities. During the 15-16 years of age, observed is an increase of the girls’ strength in comparison with the boys’ strength nevertheless the application of the same method of training. Following the application of the methodology, it was established that statistically important difference is observed for several of the signs under study, related most of all to the level of the physical preparedness where required are excellent technical skills and realization skills but from two positions only.

CONCLUSION

It can be generalized that in view of the cadet’ age of the girl competitors, the selection for the team should be improved by attracting higher in height girls. The accent of the future school and training work with the young girl basketball players should be directed to speed endurance; specific speed of moving along the ground without a ball; strength of the abdominal muscles; leading the ball at high speed; improvement of the girls’ realization skills from position and free throws.

Individual work sessions with the girl players should be increased while the efforts should be directed to those signs on which the girls have lowest marks.

The information of the research to be offered to the coaches in view of the optimization of the school training process.

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Corresponding author:

Mariana Borukova

National Sports Academy "Vassil Levski"

Department Basketball, volleyball, handball

21 Acad. Stefan Mladenov

Sofia, 1700

E-mail: marianaborukova@gmail.com