DYNAMICS OF PHYSICAL PREPAREDNESS OF STUDENTS 5-8 GRADE PRACTICING BASKETBALL

(Research note)

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Abstract

Basketball is one of the most practiced sports in school. Practicing basketball creates conditions for the development of qualities such as speed, strength, agility, quickness, endurance, flexibility and accuracy. The changes that had occurred in the course of training of students from 5^{th} to 8^{th} grade we diagnose with tests which include elements similar to the basketball game. The aim of our study is to reveal the dynamics of the physical preparedness of students from 5-8 grade, using tests for physical fitness and coordination. They include activities widely practiced in the basketball training. The research was realized on a sample of 81 students (5-8th grade) from the School for natural and mathematical studies in Shumen, divided as one control group and an experimental group. The experimental factor included was playing basketball in a third additional hour. Six motor tests were applied for both experimental and the control group in order to determine the dynamics of physical preparedness of students. Variation and comparative analyses were used for analyses of the results. The obtained results suggest that during the period of training among the boys from 5^{th} to 8^{th} grade of the experimental group occurred significant increase in the level of all investigated features of physical preparedness. Most significant are the changes in the level of endurance, agility and bouncing. There is clear evidence that at the end of the observed period the experimental group was significantly superior to the control group in the level of development of all signs. This is a proof of the right choice of tools, methods and their combination reflected in the proposed curriculum in the third additional hour for students practicing basketball.

Keywords: physical preparedness, basketball, child development, primary school students.

INTRODUCTION

The main objective of the modern system of physical education and sport is to improve the health and physical fitness of the population, to popularize and raise the sport prestige of the nation. This requires modernization of sports infrastructure and improvement of the system in accordance with the European practices. With the adoption of the National Strategy for the development of physical education and sport in the Republic of Bulgaria / for the period 2011. - 2020. year were appointed the principal and theoretical approaches to the realization of the main strategic objective of the National System for physical education and sport. The strategy focuses on ensuring the system, i.e. scope, structure, activities, performance criteria in the new market conditions, but does not specify the mechanisms and technology of the activities in their specific dimensions (National Strategy for the Development of Physical Education and Sports in the Republic of Bulgaria 2012 – 2020. (Национална стратегия за развитие на физическото възпитание и спорта в Република България 2012 – 2022, 2011). The syllabuses, curricula, state educational requirements and standards are the normative base supporting the activity of teachers.

Sports games are very well accepted by the students considering their exciting and competitive nature.

Basketball owes its popularity to the comprehensive, beneficial effect on all organs and systems in the body of people who practice it. The different qualities which the basketball creates, such as speed, strength, agility, bouncing, endurance, flexibility and accuracy lead to perfect development of the musculoskeletal system and coordinative ability of the human body. The favorable emotional background, which is created in the playing conditions is due to the rational use of all natural movements - running, jumping, throwing. (Simeonоva & Tcvetkova (Симеонова & Цветкова), 2006). The students from 5-8 grade according to state educational requirements for learning, with teaching basketball they are tasked to acquire technical and tactical skills in attack and defense, and to achieve high efficiency in the lessons and in competition, as well as to demonstrate their own style of play (State educational requirements for learning (ДОИ за учебно съдържание), 2000).

Naturally, together with improvement of the technique and tactics also evolve physical properties, in the preparation are used various conditions, maneuvers

and tasks creating aspiration among the young people for maximum expression in the exercise of the necessary motor quality (National Strategy for the Development of Physical Education and Sports in the Republic of Bulgaria 2012 – 2020. (Национална стратегия за развитие на физическото възпитание и спорта в Република България 2012. – 2022), 2011.).

According to Simeonova (Симеонова), (2012) (pp.315), to achieve the aims of the state educational requirements for core sports games - basketball sports classes largely develop and improve all motor skills of the students. The measurement of physical fitness by tests, containing exercises close to the elements of basketball lead to an increase in the efficiency of the motor skills training.

The aim of our study is to reveal the dynamics of the physical preparedness of students from 5^{th} to 8^{th} grade, using tests for physical fitness and coordination. They include activities widely practiced in the basketball training. This will realize the requirements for the implementation of a main core – sports activities and we will increase the efficiency of training. To achieve the objective we set the following tasks:

1. To examine physical preparedness using six test of physical fitness and coordination,

2. To process the empirical information with the relevant mathematical and statistical methods,

3. On the basis of comparative analysis and interpretation of the data obtained to synthesize conclusions and recommendations for practice.

METHODS

The period of the pedagogical experimental study covers the 2010/11, 2011/12, 2012/13, 2013/14 years.

The study involved 81 students (5th to 8th grade) from The School for natural and mathematical studies in Shumen - they were distributed into one control group and an experimental group (playing basketball in a third additional hour). For the collecting of the data the boys were subjected to the following tests: 20m, shuttle run, throwing a solid ball from a seated position, high jump from one place, throwing and catching a ball against a wall, move into a square - 6 x 5 meters. The first testing is carried out in fifth grade. During the training the control group studies basketball in the realization of core "Sports Games" according to the state educational requirements. The experimental group was trained in the same conditions as students engage in basketball and in the conduct of modular training in the third additional hour. Upon the completion of lower secondary education all boys conducted the same tests at the end of eighth grade. Most of the participants in the experimental group are included in the representative team of the school. Variation and comparative analyses were used for analysis of the results.

RESULTS

Results obtained using variation and comparative analyses are presented in Tables 1. - 6. Table 1. shows the data at the beginning of the study for the control group.

Particular interests in this study are changes in the groups during the school years in terms of physical preparedness. Tables 3. and 4. present the results of tests carried out at the end of the study, respectively, for the experimental and control groups.

Along with these data in Tables 5. and 6 .are presented the calculated t - criterion for a student for the

Table 1. Statistics on physical preparedness, experimental group boys, beginning of the study

No	Indicator	X min	X max	Average	S	V %	As	Ex
1.	20 m	4,25	3,32	3,54	0,51	14,40	-0,10	-0,59
2.	Shuttle run	17,00	33,00	22,8	2,43	10,66	0,61	0,43
3.	Throwing a ball	3,01	5,46	4,13	0,36	8,72	-0,35	0,83
4.	Rebound height	24,59	39,48	34,78	3,87	11,12	0,75	-0,19
5.	Catch and pass	27,35	48,34	43,26	3,46	8,00	-0,14	0,81
6.	6 x 5 meters	14,44	10,57	12,86	0,64	4,97	0,38	0,61

Table 2. Results of boys from the experimental group at the beginning of the study.

N⁰	Indicator	X min	X max	Average	S	V %	As	Ex
1.	20 m	3,92	3,30	3,56	0,59	16,57	-0,33	-0,69
2.	Shuttle run	10,00	14,00	22,90	1,71	7,49	1,07	1,33
3.	Throwing a ball	3,21	4,53	3,99	0,36	9,02	-0,46	0,73
4.	Rebound height	22,37	35,17	31,69	4,38	13,82	0,27	-0,41
5.	Catch and pass	32,43	48,38	43,32	3,57	8,24	0,30	-0,42
6.	6 x 5 meters	15,02	11,01	12,84	0,67	5,21	0,51	-0,58

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Table 3. Statistics on physical and technical preparedness, experimental group boys, end of study

No	Indicators	X min	X max	Average	S	V %	As	Ex
1.	20 m	4,03	3,07	3,36	0,29	8,63	0,81	0,91
2.	Shuttle run	23,00	34,00	30,10	3,97	13,18	-0,06	-0,70
3.	Throwing a ball	3,80	6,90	5,53	0,48	8,67	-0,49	0,67
4.	Rebound height	37,00	55,00	50,19	3,70	7,37	-0,36	-0,37
5.	Catch and pass	42,00	62,00	53,98	4,29	7,94	-0,29	0,07
6.	6 x 5 meters	12,60	11,00	11,59	0,86	7,42	-0,27	-0,64

Table 4. Statistics on physical and technical preparedness, control group boys, end of study

$\mathcal{N}_{\underline{o}}$	Indicator	X min	X max	Average	S	V %	As	Ex
1.	20 m	4,12	3,11	3,52	0,24	6,81	0,36	0,54
2.	Shuttle run	19,00	29,00	23,77	1,93	8,11	0,17	-0,06
3.	Throwing a ball	3,50	4,80	4,30	0,31	7,21	0,23	-0,68
4.	Rebound height	27,00	45,00	38,72	4,31	11,13	-0,13	-0,44
5.	Catch and pass	36,00	53,00	46,50	3,15	6,77	0,39	0,91
6.	6X5 meters	13,20	12,00	12,38	0,73	5,89	-0,56	-0,64

 Table 5. Significance of the differences between the average levels of physical preparedness boys - control group

№	Test	Begi	Beginning		End		+	D+
		Х	S	Х	S	u	ι	ΙL
1.	20 m	3,56	0,59	3,52	0,24	-0,04	1,65	65 %
2.	Shuttle run	22,90	1,71	23,77	1,93	0,27	-1,73	89 %
3.	Throwing a ball	3,99	0,36	4,30	0,31	0,31	-1,66	85 %
4.	Rebound height	31,69	4,38	38,72	4,31	7,03	-1,30	79 %
5.	Catch and pass	43,32	3,57	46,50	3,15	3,18	-1,41	82 %
6.	6 x 5 meters	12,84	0,67	12,38	0,73	-0,46	1,91	93 %

 Table 6. Significance of the differences between the average levels of physical preparedness

 boys – experimental group

N⁰	Test	Begi	Beginning		End	d	+	Dt
		Х	S	Х	S	u	ι	11
1.	20 m	3,54	0,51	3,36	0,29	-0,18	5,87	72 %
2.	Shuttle run	22,8	2,43	30,10	3,97	7,30	-14,42	97 %
3.	Throwing a ball	4,13	0,36	5,53	0,48	1,40	-16,23	96 %
4.	Rebound height	34,78	3,87	50,19	3,70	15,41	-6,80	97 %
5.	Catch and pass	43,26	3,46	53,98	4,29	10,72	-8,46	96 %
6.	6 x 5 meters	12,86	0,64	11,59	0,86	-1,27	13,14	94 %

respective groups with which we will make an analysis of the significance of the differences obtained at the end of the experiment. The summarized data for the tests and the guaranteed probability of differences between the average values for the boys from the control group are shown in Table 5. The summarized data for the tests and the guaranteed probability of differences between the average values for the boys from the experimental group are shown in Table 6.

DISCUSSION AND CONCLUSION

The analysis of the average values obtained for boys at the beginning of the study from the control and experimental groups showed that possess equally basic technical skills and exhibit a similar physical quality, which puts the two observed samples on an equal footing and guarantee for correctness at the start of the experiment. The dissipation in the range of 20% demonstrates the approximate homogeneity of the groups in terms of physical ability at the beginning of the study. Commenting on the resulting coefficients of asymmetry and excess, we note that the two groups qualify for normality and symmetry of the studied indicators.

The interpretation of the tables shows that in both groups there was an increase in the average values of the indicators, bearing information on the level of development of the tested signs of physical preparedness. Increases showed that during the study, more rapid developments of all signs were seen in boys from the experimental group. The low share in the indicator 20 meters for the experimental group and the difference of 0.18 seconds we can give to the fact that compared to other motor qualities of man speed is the most difficult to improve. It is particularly difficult to develop frequency of movements, which is mostly considered to be genetically determined and can actually be improved to 14-15 years of age. Zheliazkov (Желязков), (1968) argues that after this performances are improved mainly at the expense of the power component and technical improvement. The resulting change may be due to the technical improvement and not to learning in training and is not confirmed with guaranteed probability in both groups.

Ассогдіпд to Yordanova (Йорданова), (2008), a task of priority in physical education in school is to develop a *general endurance*. It is endurance in terms of continuous operation with moderate intensity (power), comprising the operation of much of the muscle apparatus. The differences obtained at the end of the experiment in both groups in terms of the indicator "shuttle run" are positive. The growth of 7.30 times for students practicing basketball from the experimental group, we ascribe to the numerous exercises and teaching games in which this motor quality is improved. This is also due to the age characteristics of students from 5-8 grade. In the control group, with respect to this feature, we notice an increase of 0.27 times, which is due to random factors. (t = -1,73)

The combination of exercises for different shots, educational and double games applied in modular basketball training lead to positive change in the test *"Throwing a ball"*. Improved strength of the upper limbs of boys playing basketball in the experimental group is confirmed with guaranteed probability - 96%. The improvement of students in the control group of 0.31 meters is confirmed by 85% trustworthiness and is due to random factors.

With great reliability - Pt = 97% we will confirm the change from the beginning and final average values for the indicator "*Rebound*" for the experimental group. Perhaps this large increase from X = 34.78 cm to X=50.19 cm is because this feature occurs in the shooting on the move, shooting with rebound, and control of the ball. The suggested exercises for improvement of these techniques in the third additional hour have influenced bouncing. We do not have a guaranteed probability that the growth of 7.03 cm for the boys in the control group is significant. During the training occurs some stabilization of the indicator *"Catch and pass in a wall"* in the experimental group. Guarantee for the improvement of the technical skills of students to pass accurately and quickly is the change of 10.72 times. We look for a reason to believe that the impact on the experimental group in terms of the accuracy of the application was effective enough in the changed means and methods of the modular training program. The exercises that we apply lead to improved agility, physical endurance of the arms and shoulders and the technique of catching and passing. The increase in the change of the speed and accuracy of the passing during the time of the study is significant and confirmed with a high probability Pt> 96%.

In modern basketball the ability to move through the field without the ball is very important. "*Defensive movement 6 x 5 m*" is an indicator that provides information on the individual defensive technique and speed of response to changing conditions of the game. And here we observe a positive change in both groups. The improvement of the average performance in the experimental group at the end of the period is significant Pt = 94%, while for the students in the control group it is Pt = 93%.

With high guaranteed probability, it can be argued that during the period of training among the boys from 5th to 8th grade of the experimental group occurred significant increase in the level of all investigated features of physical preparedness. Most significant are the changes in the level of endurance, agility and bouncing. Our opinion is due not only to the physical development of the students, but also the teaching learning process with the attached program of modular training in basketball. For the same time, growth can be observed in the control group, especially in terms of speed of response for protective movement. The changes occurring in respect of other indicators are insignificant.

There is clear evidence that at the end of the observed period the experimental group was significantly superior to the control group in the level of development of all signs. This is a proof of the right choice of tools, methods and their combination reflected in the proposed curriculum in the third additional hour for the students practicing basketball.

REFERENCES

- Aleksić, D., Kocić, J., Tošć, S., Mekić, B., & Milenković, V. (2012). The examination of the effects of basketball training process on coordination developing on 9-10 years old boys. *Research in Kinesiology*, 40(2), 87-91.
- Цонкова, Д. (2007). *Теория и методика на физическото възпитание* [Theory and methods of physical education. In Bulgarian.] Велико Търново: Университетско издателство "Св. св. Кирил и Методии".
- ДОИ за учебно съдържание (2000). [State educational requirements for learning. In Bulgarian.] ДВ бр. 48 от 13.06.2000 г.
- Herodek, K., Simonović, C., & Cvetković, D. (2013). The effects of strength and speed training on trained and untrained boys. *Research in Kinesiology*, 41(2), 194-197.

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- Йорданова, H. (2008). Физическите и координационните способности – фактори за спортното обучение на ученици [Physical and coordination abilities - factors of sports training of students. In Bulgarian.] Шумен: Faber.
- Маргаритов, В. (2003). *Ръководство по баскетбол* [А Basketball Guide. In Bulgarian.] Пловдив: ПУИ.
- Национална стратегия за развитие на физическото възпитание и спорта в Република България 2012 – 2022. (2011). [National Strategy for the Development of Physical Education and Sports in the Republic of Bulgaria 2012 -2020. In Bulgarian.] София.

Симеонова, Т., & Цветкова. Н. (2006). Баскетбол. [Bas-

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ketball. In Bulgarian.] Шумен: Университетско издателство

- Симеонова, Т. (2012). Динамика на физическа дееспособност на ученици IX – XII клас, занимаващи се с баскетбол [Dynamics of physical abilities of students IX -XII class dealing with basketball. In Bulgarian.] Сборник научни трудове, Образователни технологии, ШУ (pp. 315), Велико Търново: Издателство "Фабер".
- Желязков, Ц. (1968). Баскетболът развитие на играта и проблемът за атлетизма [Basketball - development of the game and the problem of athleticism. In Bulgarian] София: Медицина и физкултура.