CAPABILITY AND TECHNICAL PREPAREDNESS OF STUDENTS FROM BASKETBALL GROUPS AT THE MEDICAL UNIVERSITY - SOFIA

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ABSTRACT

The state of physical capacity and technical preparedness among students is a very accurate and objective indicator through which the efficiency of the basketball training process can be evaluated. The purpose of the study is to explore the physical fitness state and technical preparedness of the students in their Sports training lessons, basketball groups, at the Medical University (MU), Sofia. The study was conducted during school-year 2019-2020. It was used a test battery with 10 indicators. The indicators give information about students' physical development, fitness and capacity, and their technical preparedness. The derived results were processed mathematically-statistically through variation analysis, t-test benchmark by Student, body mass index, comparison analysis, and correlation analysis. In conclusion the different correlational and variational interdependencies were discovered, and also a positive changes were noticed in the indicators for physical capacity and technical readiness, as a result from the basketball training of the students who were part of the study.

Key words: sport, preparedness, training, physical capacity, physical development.

INTRODUCTION

Physical capability is a complex indicator for the overall functional status of the human being and his/her motor capacities, closely related to the level of development and manifestation of the basic motor characteristics. Physical capability depends on the physical development, gender, age and inherited characteristics (1).

Physical capacity reflects integrally and multi-dimensionally the health condition, viability and physical fitness of the individual. It is characterized by the state of the various motor qualities that can be reported by different motor and activity tests (2).

Sports capabilities are defined by the physical capacity, sports-technical, tactical and intellectual capabilities, as well as by the knowledge and experience of the athlete (3).

The structure of sports technique reveals the regular interconnections and relations between its subsystems and their elements. The unified structure of sports technique as a system of movements can be considered in two aspects: motor and information. The main task related to sports technical ability, in general can be defined as reducing the impact of bad resistances and increasing the efficiency of the acting force with the most rational use of driving forces - active muscle traction and especially the powers that have other sources (4).

Studies on the physical development, physical capabilities and technical preparedness among students have been carried out by (5-8).

METHODOLOGY

The purpose of the study is to reveal the status of the physical capacity and technical preparedness of the students in their education in "Sport", in the basketball groups of the Medical University –

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Sofia. The study was conducted during the 2019-2020 school year.

30 students from the sport groups in basketball were studied.

In order to achieve the objective of the study, we set the following main tasks to perform:
1. Studying the status of the issue with the physical development, physical capacity and technical preparedness among students;
2. Gathering information about the status of the indicators of the physical development, the physical capabilities and the technical preparedness of the students in the basketball groups at MU – Sofia;
3. Finding the average values and the dispersion of the studied indicators for the students;
4. Revealing the correlations between the indicators for physical development, physical capacity and technical preparedness;
For the realization of the set objective, and performance of the listed tasks, we have applied sports-pedagogical testing. The test battery includes 10 indicators for recording the physical development, physical capacity and technical readiness of the students during their "Sport" training in the basketball groups at the MU – Sofia.

The achieved results at the tests were processed mathematically and statistically through application of variation analysis, t-criteria of Student, Body-mass Index, comparison analysis and correlation analysis.

ANALYSIS OF THE RESULTS
In **Table 1** we have shown the results which carry information about the physical development, the physical capabilities and the technical preparedness of the students in the first testing and the second testing. To carry out the comparison analysis, we have used the t-criterion of Student for independent samples. Selecting it was the right choice to do, since the calculated coefficients for asymmetry and excess do not exceed the critical values at the level of significance $\alpha=0,05$.

Table 1. *Physical development, physical capabilities and the technical preparedness of the students*

№	Indicators	I testing		II testing		d	t	P(t)
		X_1	S_1	X_2	S_2			
1.	Height	176,63	6,91	176,63	6,91	0,00	0,00	0,00
2.	Weight	74,83	6,84	74,20	7,06	0,63	2,62	98,60
3.	Body-mass Index (BMI)	23,94	1,48	23,75	1,35	0,19	2,53	98,28
4.	Hand dynamometric (R)	45,56	7,81	47,19	7,86	-1,63	-8,26	100,00
5.	Hand dynamometric (L)	40,70	7,81	41,88	7,96	-1,18	-9,81	100,00
6.	Triple jump	6,31	0,46	6,38	0,46	-0,08	-9,26	100,00
7.	Long Jump from standing position	194,83	14,55	196,37	14,68	-1,53	-6,71	100,00
8.	Lay-ups – 1 min.	10,03	1,92	11,00	1,39	-0,97	-4,35	100,00
9.	Penalty shots (Free throws)	5,83	1,39	6,87	1,17	-1,03	-8,46	100,00
10.	Defense slide between stands (cones)	11,80	1,17	10,81	1,02	1,00	8,82	100,00

As we can notice in **Figure 1**, the students have improved their performance compared to the first testing. This can be mostly observed in indicators №4 (Dynamometric of right hand), №7 (Long jump from standing position), indicator № 9 (Free throws) and indicator №10 (Defense slide between cones). In the second testing, indicator №10 (Defense slide between cones), which carries information about technical preparedness, students have improved their performance by almost 1 second.
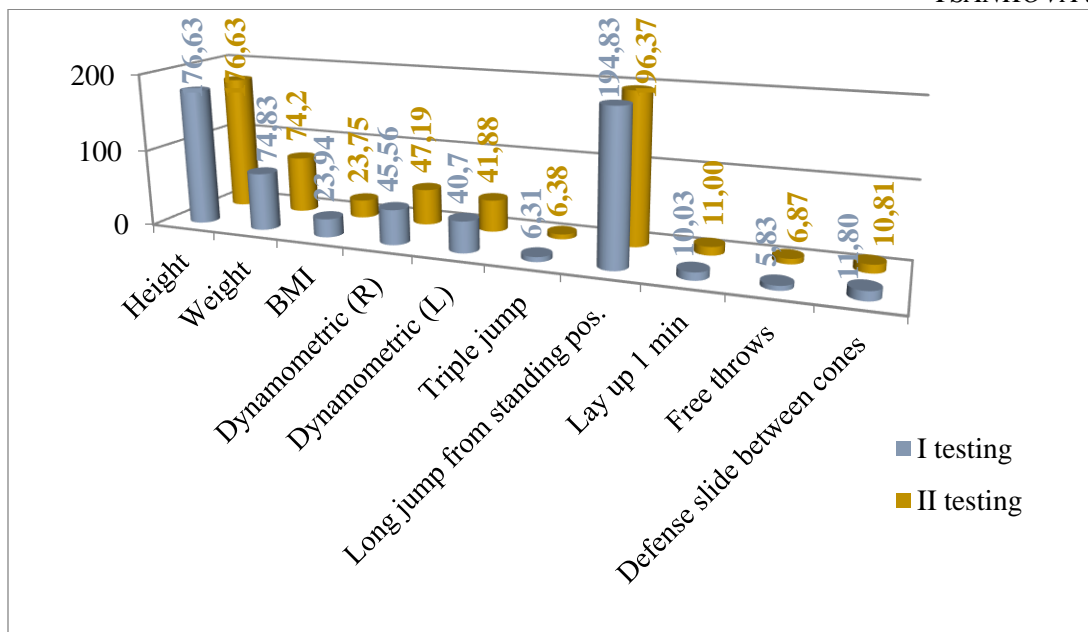
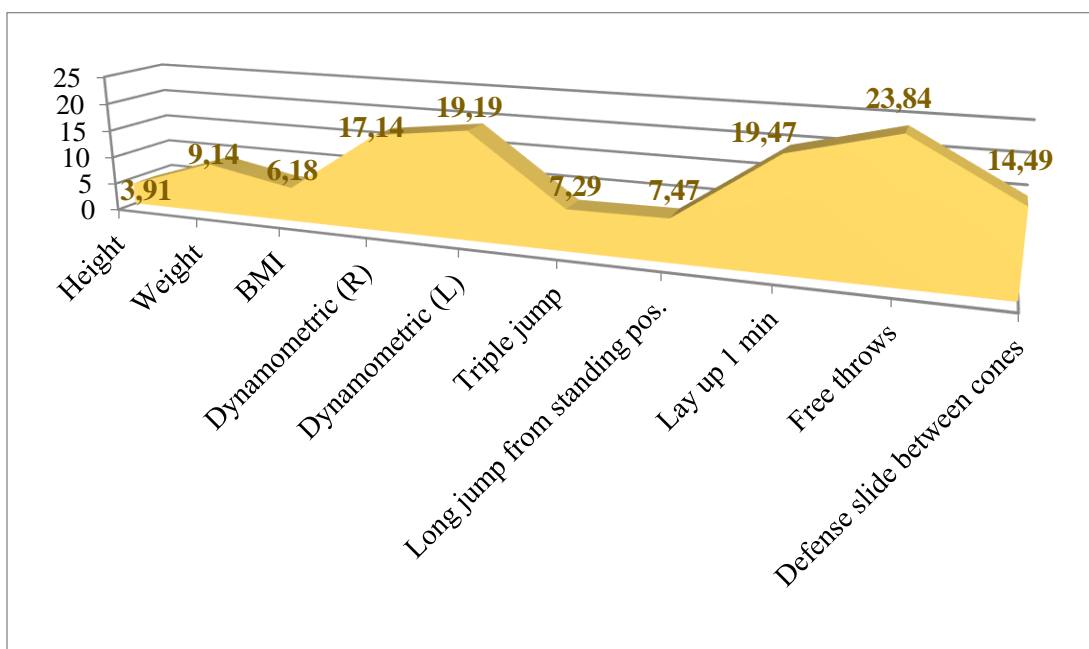**Figure 1.** Comparative analysis of the students between 1st and 2nd testing

Figure 2. Variability of the indicators for physical development, physical capacity and technical preparedness – first testing

Figure 2 contains the values of the dispersion (variability) among the studied indicators for the students during the first testing. From the analysis of the results, we can conclude that the group is homogenous at indicator №1 (Height), V=3,91%, indicator №2 (Weight), V=9,14%, indicator №3 (BMI), V=6,18%, indicator №6 (Triple jump), V=7,29% and at indicator №7 (Long jump from standing position), V=7,47%. The studied sample of students is relatively similar at indicator №4 (Dynamometric of right hand), V=17,14%, indicator №5 (Dynamometric of left hand), V=19,19%, at indicator №8 (Lay up 1 min), V=19,47%, indicator №9 (Free throws), V=23.84% and indicator №10 (Defense slide between cones), V=14.49%.
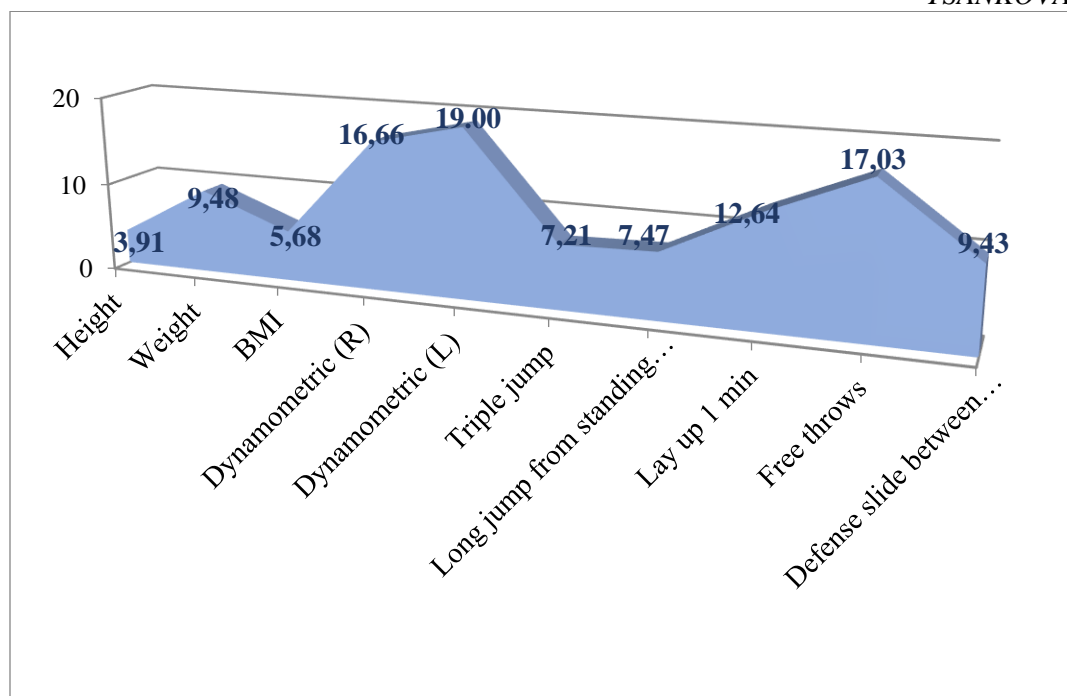
Figure 3. Variability of the indicators for physical development, physical capacity and technical preparedness – second testing

Analyzing **Figure 3**, we can point out that during the second testing of the students, the highest variability coefficient marks indicator №5 (Dynamometric of left hand), V=19,00%. The tested sample are homogenous at indicators №1 (Height), V=3,91%, indicator №2 (Weight), V=9,48%, indicator №3 (BMI), V=5,68%, indicator №6 (Triple jump), V=7,21% and indicator №7 (Long jump from standing position), V=7,47% and indicator №10 (Defense slide between cones), V=9,43%. The group are relatively similar at indicators №4 (Dynamometric right hand), V=16,66%, №5 (Dynamometric left hand), V=19,00%, indicator №8 (Lay up 1 min), V=12,64%, indicator №9 (Free throws), V=17,03%.

In **Table 2** we have presented the correlation matrix of the physical development, physical capacity and technical preparedness of students at the first testing.

Table 2. *Correlation matrix of the indicators for students – first testing*

№	Indicator	1	2	3	4	5	6	7	8	9	10
1.	Height	1									
2.	Weight	0,736	1								
3.	BMI	-0,144	0,559	1							
4.	Dynamometric (R)	0,723	0,621	0,008	1						
5.	Dynamometric (L)	0,738	0,567	-0,093	0,980	1					
6.	Triple jump	0,786	0,712	0,077	0,840	0,822	1				
7.	Long jump from stand.pos.	0,751	0,622	-0,024	0,878	0,881	0,847	1			
8.	Lay up 1 min	0,637	0,486	-0,064	0,655	0,702	0,551	0,630	1		
9.	Free throws	0,233	-0,043	-0,376	0,301	0,398	0,214	0,464	0,492	1	
10.	Defense slide between cones	-0,671	0,153	0,153	-0,485	-0,522	-0,590	-0,603	-0,640	-0,447	1

We have applied simple linear correlation, via the method "all against all". The level of significance of the calculated coefficients of correlation has been determined at high extent of guarantee probability ($P_t \geq 95\%$).

During the analysis we have deducted 34 reliable correlations between the studied indicators. With relative correlation there are 8 correlation bonds, significant bonds have 13 correlations, 12 are with high significance correlations, and very high correlation – there is 1. Very high is the correlation between indicators №4 (Dynamometric right hand) and №5 (Dynamometric left hand), r=0,980. The highest number of correlation bonds – 8, are noticed at indicators №7 (Long jump from standing position) and №8 (Lay up 1 min). The fewest number of correlation bonds has the indicator №3 (BMI) – 2.

Table 3. contains the data for the correlation matrix of the physical development, physical capacity, and technical preparedness during the second testing.

***Table 3.** Correlation matrix of the indicators for students – second testing*

№	Indicator	1	2	3	4	5	6	7	8	9	10
1.	Height	1									
2.	Weight	0,798	1								
3.	BMI	-0,027	0,579	1							
4.	Dynamometric (R)	0,747	0,667	0,085	1						
5.	Dynamometric (L)	0,747	0,609	-0,015	0,974	1					
6.	Triple jump	0,791	0,742	0,156	0,889	0,847	1				
7.	Long jump from stand.pos.	0,751	0,664	0,077	0,889	0,864	0,838	1			
8.	Lay up 1 min	0,599	0,533	0,073	0,651	0,633	0,540	0,549	1		
9.	Free throws	0,182	-0,010	-0,287	0,357	0,419	0,207	0,408	0,191	1	
10.	Defense slide between cones	-0,643	-0,471	0,096	-0,499	-0,534	-0,549	-0,477	-0,540	-0,354	1

The correlation dependencies between the indicators are 33. Of which, moderate correlation dependence have 7 bonds, significant correlations – 14, high correlation – 11, and with very high correlation bond there is 1. Just like in the first testing, in the second testing too shows the highest correlations between indicators №4 (Dynamometric right hand) and №5 (Dynamometric left hand), r=0,974. The highest number of correlation dependencies – 8, are noticed at indicator №2 (Height), indicator №7 (Long jump from standing position) and indicator №10 (Defense slide between cones). Only in one correlation is the indicator №3 (BMI).

CONCLUSION

In conclusion, after the analysis of the testing material, a number of interrelated and interdependent bonds can be discovered, which are important for the teaching of basketball to the students from MU – Sofia. The results of the two tests show an improvement in the homogeneity of the studied students in terms of technical preparedness indicators. The different correlations between the indicators for physical development, physical capacity and technical readiness in both tests were established. As a result of the conducted basketball training with the studied students, positive changes in indicators for physical capacity were observed (Dynamometric of the right hand and Long jump from standing position), and for technical preparedness (Lay up 1 min, Free throws, Defense slide between cones).

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