PHYSICAL PREPARATION RESULTS INDICATORS AND PHYSICAL DEVELOPMENT OF STUDENTS FROM SOFIA UNIVERSITY – REPUBLIC OF BULGARIA

Preliminary communication

Georgi Ignatov and Iren Peltekova
Sofia University "St. Kliment Ohridski", Department of Sport, Sofia, Bulgaria

Abstract

The aim of this publication is to examine and analyze some of the indicators of physical preparation and physical development of students from profiled football and basketball groups at Sofia University "St. Kliment Ohridski "(SU) – Republic of Bulgaria, and on the basis of those, to indicate some observations on their preparation and to improve this preparation of students in the future. The study was conducted with 90 students, 48 of them attend football classes and 42 – basketball classes. All students are male in their I – IV year of study in a regular education program. Their average age is 20 years old. The results have been processed using analysis of variance and the method of indices. The values obtained show a different level of physical preparation the tested students. The research sample is highly heterogeneous in most indicators. Generally, the formation of educational-sporting groups with such large differences in the physical characteristics of students hinders the learning process.

Keywords: *football, basketball, motor tests, analysis of variance, method of indices, learning process, physical characteristics, physical development*

INTRODUCTION

Although seemingly, the physical preparation and physical development of young people remain in the shadows as a factor for success in employment, the facts speak for themselves. Namely, physically prepared and healthy person is the most fulfilling, active and employable, does not get tired quickly, it is not absent from work, it is motivated and it expects a positive outcome from its work. Therefore, we believe that physical preparation and physical development of students is an important factor for their successful labor activity.

A number of authors, at home and abroad, convincingly speak about the importance of physical preparation of students and its connection to the employment opportunities, and moreover, authors report a decrease in the physical activity of students leading to a deterioration of their health.

Many studies conducted by sports experts and lecturers at higher education institutions (HEI) in Russia, as (Vilenskiy (Виленский), 1998; Ilyinich (Ильинич), 1990; Feytullaev (Фейтуллаев), 2008), have found that during the higher education study period, the level of physical activity and physical condition of young people is deteriorating. In a report (Vorotova (Воротова), 2014) presents data on students from "Izhevskaya Gosudarstvennaya Selyskohozyaystvennaya Academy" (IzhGSHA) in the city of Izhevsk, where in 2008 at the Department of Physical Education 54.6% of the registered students indicate deviations from the health condition.

Similar data are observed in Bulgarian universities. The authors (Dyakova & Bozhkova, 2013), examine and compare the level of development of basic mobility characteristics of students from two universities. The benchmarking data analysis show that the movement speed of students from both universities is not at sufficiently high level, relatively better developed is the speed of the strong hand. The physical qualities flexibility, explosive strength of lower limbs, power endurance of upper limbs, shoulder girdle and abdominal muscles and general endurance occur at a higher degree in students at Trakia University – Stara Zagora than within the students at the Medical University – Sofia.

As a result of a study conducted with students from Trakya University, (Dyakova (Дякова), 2008) found that reduced physical activity has had an impact on body mass and strength-endurance of upper limbs for both genders, and for male students also on endurance.

Researchers as (Kadrov (Кадыров),1987; Sapov & Solodkov (Сапов & Солодков), 1980) and others consider performance as a system of three components: the information component is characterized by indicators such as speed of processing information (momentary and operating memory, allocation of attention); the functional component includes indicators of functional status, tremor, tapping-test, miotonometriya, index of tension; the motor component reflects the performance of the motion system (general endurance, ability to control the muscle strain, speed-strength qualities, coordination abilities). The in-depth study of these three components, including the state, development and improvement of basic motor characteristics, helps to increase the work efficiency and health care of the students.

The varying degrees of preparation and motivation of students require differentiation in the approach of teaching physical education and sports. Many universities deviate from the traditional form of education and offer a variety of movement activities, including new sports in the compulsory program, the optional modular courses, the extracurricular forms and others (Bozhkova (Божкова), 2011, 2012a, 2015; Dyakova & Peeva (Дякова & Пеева), 2006; Dyakova & Petkov (Дякова & Петков), 2011; Kachev, Zlatev & Doncheva (Къчев, Златев & Дончева), 2009; Peeva (Пеева), 2008; Slavcheva-Hinkova, Bozhkova & Pavlov (Славчева-Хинкова, Божкова & Павлов), 2014; Dy-

akova, 2012, 2013; Zlatarova & Bozhkova, 2008,).

In this regard, we have measured the physical preparation and physical development of students from Sofia University "St. Kliment Ohridski", who attend football and basketball classes in the profiled sports groups. These groups engage students who had not played organized football and basketball respectively (or if they had played organized, it has been for a short period of time), therefore, working with them does not require achievement of high sports results. The classes with these students contain some basic technical and tactical elements, knowledge of the rules, etc.

In this study, besides establishing the current physical preparation of students, the weaknesses of their preparation were noticed which will help to purposefully work to improve these weaknesses. We assume that the performance of this study will increase students' motivation to play sports and to improve their skills, and thus, to improve their physical preparation.

All stated above defines the purpose of the study - namely, to examine and analyze some of the indicators of physical preparation and physical development of students from football and basketball profiled groups at Sofia University "St. Kliment Ohridski" Sofia – Republic of Bulgaria.

METHODS

This study was conducted in November and December 2015 during practical classes in sport.

Subject of the study were students from profiled groups in sport - football and sport - basketball.

Object of the research is physical preparation and physical development of students from Sofia University "St. Kliment Ohridski", Sofia – Bulgaria.

The sample of the study includes 90 students, 48 of them attend football classes and 42 – basketball classes. All students are male in their I – IV year of study in a regular education program. The tested students are 18 to 23 years old. The average age of students is 20 years, where most students are 19 years old - 37, and only 3 students are 23 years old. Students were born between 1992 and 1997.

To establish their physical preparation, students implemented physical standards which include: dynamometric (force of the grip of weak and strong hand), sprint – 20 meters, long jump from place, maximum number of squats for 30 seconds, in-depth forward lean, maximum number of sit-ups for 30 seconds.

To determine the physical development of the students, data from 3 morphological parameters was collected - height, weight and body mass index (BMI), which is mea-

sured using the formula: weight in kilograms divided by height in squared meters (kg / m2).

The research results have been processed using the analysis of variance and the method of indices.

RESULTS

The analysis of the results reveals the average and the variability of the observed indicators of students from the football group (Table 1.), the basketball group (Table 2.) and the overall results for all students (Table 3.).

The tested students are 18 to 23 years old. The average age of students is 20 years, where most students are 19 years old - 37, and only 3 students are 23 years old. Students were born between 1992. and 1997.

The presented data on physical development includes: height, weight and level of obesity. The average height of the tested students is 181,1 cm and the average weight, 75,99 kg. The following differences between the students from the football and basketball groups were noticed: data shows that the football players' average height is 180,2 cm and average weight is 73,65 kg, where the basketball players show an average height and weight of 182,2 cm and 78,67 kg respectively. Even though the results of the groups do not differ much between each other, it can be said that the height of the tested students is higher than the average male height of the population in Bulgaria. The average height of male in the Republic of Bulgaria according to data from January 2010 is 175,2 cm, as in the capital it is higher – 178,1 cm, and the average weight of male is 79,3 kg, as in Sofia is more – 80,3 kg (http://www.bnews.bg/article-4821, the last visit – 02/10/2016). The higher height of the students compared to the average for the country could be explained by the fact that a large percentage of the research participants have practices sports when they were younger, which may have been significant.

Based on the results of the analysis of variance of physical development – height and weight of students, it was found that within the groups these indicators are significantly heterogeneous. The variance (V) of the indicator height of football players is 50.64%, while the one of basketball players is 39.84%. When considering the indicator weight football players score V% of 105,9%, and basketball players score V% of 127,1%.

According to the body mass index (BMI), students have normal weight within the healthy range considering their gender and age – in average (M = 23,2), in the range of 20 to 24. There are a few exceptions and a large swing (R = 18.1) from 16 (min) to 34 (max), but these cases are singular and not associated with obesity or malnutrition, those are due to a purposeful sports preparations (in particular in the cases of registered weight in excess).

Table 1. Studied group: football - mean and variance of results (N=48)

№	Indexes	Mean	SD	Min	Max	R	V	Kurt.	Skew
1	Age (years)	20,02	1,345	18	23	5	1,808	-,671	,728
2	Height (cm)	180,2	7,116	168	197	29	50,64	-0,27	0,4
3	Weight (kg)	73,65	10,288	54	105	51	105,9	0,5	0,58
4	Bodymass index (index)	22,67	2,575	18,6	30,1	11,4	6,63	0,15	0,62
5	Handgrip str. strong (kg)	43,83	9,77	22	72	50	95,46	0,54	0,23
6	Handgrip str. weak (kg)	41,33	8,509	18	64	46	72,4	1,05	-0,3
7	Long jump (cm)	229,7	15,656	205	270	65	245,1	0	0,7
8	Squats – 30 s (quantity)	29,21	4,731	18	39	21	22,38	-0,39	0,02
9	Flexibility (cm)	108,8	6,695	89	123	34	44,82	0,67	-0,3
10	Speed – 20 m (s)	3,185	0,2144	2,7	3,7	1	0,05	0,02	-0,1
11	Sit-ups - 30 s (quantity)	23,46	5,43	16	40	24	29,49	1,99	1,36

Table 2. Studied group: basketball - mean and variance of results (N=42)

№	Indexes	Mean	SD	Min	Max	R	V	Kurt.	Skew
1	Age (years)	19,98	1,316	18	23	5	1,731	-,721	,451
2	Height (cm)	182,2	6,312	170	197	27	39,84	0,09	0,24
3	Weight (kg)	78,67	11,272	50	108	58	127,1	0,79	0,27
4	Bodymass index (index)	23,81	3,386	16	34	18,1	11,46	1,17	0,32
5	Handgrip str. strong (kg)	47,5	9,526	20	68	48	90,74	1,34	-0,4
6	Handgrip str. weak (kg)	42,9	8,653	23	60	37	74,87	0,62	-0,3
7	Long jump (cm)	222,6	30,005	140	300	160	900,3	1,35	-0,4
8	Squats – 30 s (quantity)	27,21	4,857	16	40	24	23,59	0,09	0,17
9	Flexibility (cm)	106,1	6,45	92	125	33	41,6	1,18	0,43
10	Speed - 20 m (s)	3,25	0,338	2,3	4,3	2	0,11	2,17	0,51
11	Sit-ups - 30 s (quantity)	20,9	4,863	14	30	16	23,65	-0,7	0,56

Table 3. All tested students - mean and variance of results (N=90)

№	Indexes	Mean	SD	Min	Max	R	V	Kurt.	Skew
1	Age (years)	20	1,324	18	23	5	1,753	-,710	,594
2	Height (cm)	181,1	6,797	168	197	29	46,2	-0,24	0,27
3	Weight (kg)	75,99	10,99	50	108	58	120,8	0,44	0,44
4	Bodymass index (index)	23,2	3,018	16	34	18,1	9,11	1	0,56
5	Handgrip str. strong (kg)	45,54	9,777	20	72	52	95,6	0,49	-0,1
6	Handgrip str. weak (kg)	42,07	8,564	18	64	46	73,34	0,71	-0,3
7	Long jump (cm)	226,4	23,596	140	300	160	556,8	2,76	-0,5
8	Squats - 30 s (quantity)	28,28	4,867	16	40	24	23,69	-0,25	0,07
9	Flexibility (cm)	107,5	6,681	89	125	36	44,63	0,46	0,07
10	Speed - 20 m (s)	3,22	0,279	2,3	4,3	2	0,08	2,7	0,56
11	Sit-ups - 30 s (quantity)	22,27	5,302	14	40	26	28,11	1,35	1,02

The obtained values of the variance coefficient show that the sample studied is highly heterogeneous in most indicators (V% >30%) with dispersion greater than 40%, while the strength of the grip of the hands (V) is above 70%. Particularly large is the variance of the lower limbs explosive power test - long jump from place (v = 556,8%), where this percentage within the basketball players is v = 900,3%.

Only with the indicators age (V) = 1.75%, body mass index (BMI), where (V) = 9,11% and the test for linear speed 20 m, where (V) = 0,08%, the sample studied is strongly homogeneous. Considering the test of strength of the abdominal muscles the variance (V) = 28,11%, and the strength of lower limbs (maximum number of squats in 30 s), V = 23,69%, which defines students as approximately homogeneous in these indicators. The remaining six indicators group is heterogeneous (V% > 30%). These data are indicative of the different level of physical preparation of the students. The formation of educational-sports groups with the presence of such large differences in physical qualities of students hinders the learning process. Due to this reason, it happens that the workload in sports classes for some students is too low and for others is very high.

The strength of the strong hand is 3.7% greater within basketball players. The strength of the weak hand is 1.6% greater within them as well. This we can explain by the fact that the basic techniques in basketball are executed with hands – catching, passing, shooting and dribbling.

The differences in two other indicators: long jump and squats are respectively 5.1% and 2 squats more in favor of the football players. This can be explained by the fact that the football players have greater explosive power and strength endurance – they can run longer distances at a bigger field.

The difference in average performed sit-ups, which is 2.9 sit-ups in favor of football players, we explain by the fact that the height of basketball players is greater and therefore, the distance carried out from a lying to a sitting position is greater.

Regarding flexibility and speed, there are minimal advantages in favor of the football players, 2.7 cm and 0.11 sec respectively. This can also be explained to some extent by the greater height of the basketball players.

DISCUSSION AND CONCLUSIONS

A physically well-prepared and physically well-developed person is complete and active at work. Physically prepared and physically developed student is vital, motivated and energetic during his daily duties at the University and expects positive outcomes of its work. Physical development and physical preparation of young people during their studies is an important factor for their successful labor activity and have a great influence on the development of their identity and their quality of life in the future.

The results of a analysis of variance show that the sample studied is homogeneous in terms of age (M = 1,753). Based on the results of the analysis of variance of physical development - height and weight of students, it was found that within the groups these indicators are significantly heterogeneous. According to the body mass index (BMI), students have normal weight within the healthy range considering their gender and age.

The obtained values of the variance coefficient show that the sample studied is highly heterogeneous in all indicators, excluding the speed, with dispersion greater than 40%. The variance (V) of the strength of the grip of the hands is above 70%. Particularly large is the variance of the lower limbs explosive power test - long jump from place (v = 556,8%). Considering the test of strength of the abdominal muscles, the variance (V) = 28,11%, and the test of strength of lower limbs (maximum squats in 30s), V = 23,69%. The variance of the flexibility test is (V) = 44,63%. Only in the linear speed 20 m test, the studied sample shows to be str-

ongly homogeneous with (V) = 0,08%.

These data are indicative of the different level of physical preparation of the students. The formation of football and basketball educational-sports groups with the presence of such large differences in physical qualities of students, in general, hinders greatly the learning process. In fact, this is the reason why in practice the workload in sports classes for some students is with too low intensity, but for others the same workload is with very high intensity. Thereby, the effect of the sport classes for students is reduced.

The improvement of the work with students in the future is the role of the sports experts at the University, who should not only increase the quality of their teaching in line with the current trends, but also to plan specific measures and selection activities in order to balance the homogeneity of sports groups with the aim of improving the quality of the learning process and to increase the result of exercising of the students during their stay at the University.

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Correspondence:

Georgi Ignatov
Sofia University "St. Kliment Ohridski"
Department of sport
15 Tzar Osvoboditel 1504 Sofia,Bulgaria
E-mail: gochev730626@abv.bg