



A STUDY ON THE ENTRY LEVEL OF PHYSICAL DEVELOPMENT OF 1ST AND 2ND YEAR STUDENTS AT THE BEGINNING OF THEIR FITNESS TRAINING IN UNIVERSITY OF NATIONAL AND WORLD ECONOMY (UNWE)

E. Tosheva*, M. Shishkov

Department Physical Education and Sports, University of National and World Economy, Sofia,
Bulgaria

ABSTRACT

The article presents results that are part of a larger scientific study aimed at identifying changes in the physical development and skills of female students practicing fitness during their education at UNWE. The purpose of the specific scientific research is to determine the entry level of physical development of female students at the beginning of their education in the first and second academic years. 100 female students from the fitness groups were surveyed - 50 for each course. The results of the study show that the distribution of data by different indicators is within the same limits, but there are specific results due to prior individual preparation.

The methods that were used to solve the research tasks are: anthropometry, dynamometry. Five particular signs having information on the degree of development of the major morphofunctional features were examined. The body mass index was calculated to provide information on the degree of obesity of the student groups studied.

The study concludes that the data of female students practising fitness with different internships are similar, which provides general guidance for improving the organization and methodology of training.

Key words: students, physical development, fitness, professional qualification

INTRODUCTION

Physical education and sports are the main active factor of the external environment, which affects the morphofunctional indicators of the body. The impact of physical exercises on the human body is specific and depends on the type of sports, intensity, duration, regularity, etc. (1, 2).

According to the World Health Organization, more than half of Bulgarians over the age of 20 are overweight, and according to studies by the Bulgarian Centre for Public Health, one in five people of active age in our country is obese, similar data quoted by the US Department of Health (3).

**Correspondence to: Ekaterina Tosheva, University of National and World Economy, Department Physical Education and Sports, 1700, Sofia, Bulgaria, Studentski grad, E-mail: katia_tosheva@abv.bg, GSM: +359888986567*

Nowadays, the role and importance of the organized process of physical education and sports are becoming increasingly important. The problem of managing and optimizing this process in higher education is especially significant (4).

University sports education that is in the form of sports training, considered from a pedagogical point of view, is a process of education, training, improvement of the functional indicators of the students under the constant pedagogical control and in the conditions of a certain hygienic regime, in order to achieve high sports results. It is also a formation of hygienic habits, strengthening of health and the creation of need in students for systematic sports activities (5).

The results of numerous studies dealing with the problems of physical education and sports in higher education show reduced physical

activity and the existing disparities between physical development and motor skills in this age range (6).

The optimization of the physical activity of the students is directly related to the issue of improving their physical capacity. Proper physical development and a high level of physical capacity are a mandatory basis on which they must be built as socially active individuals (7).

The active participation of students from non-sports universities in physical education and sports is extremely important for their health, for their proper physical development and the acquisition of skills necessary for their future professional realization (8). Some authors establish professionally significant motor qualities for practicing the economic profession (9).

The process of optimization of the forthcoming educational and training work with the students is in the competences of the sports teachers in the higher schools. Especially important is the role of their skills for leading and quality management of the educational and training process in physical education and in particular - fitness. According to the current trends, they should not only improve the quality of teaching, but also to have specific selection plans in order to balance the homogeneity of sports groups – the aim is to increase the results achieved in sports activities by students during their sport education in the university.

Conducting fitness classes at a high professional level by teachers requires them to have a clear idea of the level of physical development of students who will be trained. Gathering all the information about the students' level of fitness, allows teachers to apply an appropriate training intensity during practical classes (10).

At the very beginning of the training, this circumstance requires to conduct sports and pedagogical testing of students to establish their entry level. Based on the data, they compile the necessary training documentation and plan the means, methods, volume and distribution of the applied training intensity.

Physical qualities, as a human manifestation and the performance of sports activities, represent a set of particular movements that are

relatively independent and specific of each individual sport (11).

According to M. Borukova "Only certain signs of physical development can be improved through targeted training" (12).

L. Kasabova studied the entry level of physical development and functional working capacity of students from the basketball groups of UNWE at the beginning of their higher education and found the following: "in general, there are no large deviations from the average levels of signs in the physical development and functional working capacity of female students" (13).

Y. Nestorov traced the changes that occurred in the anthropometric indicators of students during their studies at TU-Varna (14).

P. Mavrudiev makes a comparative analysis and reveals the peculiarities of the physical development of students from different universities and different specialties (physical education teachers, kinesitherapists, and economists) (15).

METHODS

The aim of our study is to establish the level of physical development of female students at the beginning of their training in physical education and sports - fitness, in the first and second year of their studies at UNWE.

To achieve this goal, we set ourselves the following **tasks**:

1. To make a literature review of the existing literature sources.
2. To select appropriate tests giving information about the level of development of morphofunctional features.
3. The data from the research should be subjected to mathematical - statistical processing.
4. To analyze the results and formulate conclusions and recommendations.

The survey was conducted in the period of 2017-2019.

The subject of research is the physical development of female students in Economics.

The object of study is the morphofunctional features and their specifics of female students from the fitness groups of UNWE.

A contingent of research are 100 female students studying in the fitness groups of UNWE (Sofia) - 50 from first and 50 from second academic year.

For the needs of the research the following methods were used: theoretical research of the specialized literature sources, anthropometry, and dynamometry. The following mathematical and statistical methods are used to process the results of the research:

- variation analysis;
- hypothesis testing (using Student's comparative t-test);
- index method - body mass index (BMI).

RESULTS

To establish the entry level of the students studied by us from the profiled fitness groups of UNWE (Sofia), at the beginning of the training were collected data for 5 indicators, which provide information about the degree of development of the main morphofunctional features. The body mass index is additionally calculated, it provides information about the degree of obesity of the studied students group. The results of the variational processing of the initial data from the testing for the second-year students are presented in **Table 1**.

Table 1. Average values and variability of the signs of the physical development of the second year students in the profiled fitness groups at the beginning of the school year

№	Indicators	X	S	V	min	max
1.	Heights	166,12	5,09	3,06	155	175
2.	Weight	53,68	7,68	14,3	42	75
3.	Body Mass Index (BMI)	19,44	2,2	11,31	15,98	25,35
4.	Chest circumference - breath. difference	5,26	1,71	32,55	1	9
5.	Manual dynamo - comfortable upper limb	22,7	3,29	14,5	11	32
6.	Manual dynamo. - uncomfortable upper limb	18,28	3,52	19,27	10	29

The analysis of the table shows that the average height of the studied girls is 166.12 cm, and the average weight - 53.68 kg. However, considered on their own, these indicators do not provide good enough information for the physical development of female students. This led to the need for calculation of the so-called Body Mass Index (BMI), which brings the information about the

level of nutrition of the body (Figure 1). As it can be seen from the table, the average index for the group is 19.44 kg / m².

For the needs of the research, we have made a comparison with the results of a similar study of female students from the fitness groups of the first year of UNWE - Sofia (**Table 2**).

Table 2. Average values and variability of the signs of the physical development of the first-year students in the profiled fitness groups at the beginning of their education at UNWE

№	Indicators	X	S	V	min	max
1.	Height	164,9	5,25	3,18	155	174
2.	Weight	59,72	3,37	21,71	42	90
3.	Body mass index (BMI)	22,08	4,09	18,51	15,98	32
4.	Chest circumference - breath. difference	4,60	1,69	36,75	1	10
5.	Manual dynamo. - comfortable upper limb	21,20	3,82	18,01	11	37
6.	Manual dynamo. - comfortable upper limb	16,8	3,72	22,14	10	25

The first-year students are inferior to the second-year students in terms of height by an average of 1.22 cm, but in terms of weight they are superior to them by an average of 6.04 kg. Respectively, the value of the body mass index is higher by 2.6 kg / m², at the indicator 4 - respiratory difference by 0.66 cm.; indicator 5 - manual dynamometry / comfortable hand / with 1.5 kg. and indicator 6 - manual dynamometry / awkward hand / with 1.48 kg.

The verification of the significance of the observed differences between the average levels of the studied traits of the two groups of female students included in the fitness groups, performed using Student's comparative t-test, shows that second-year students have higher values in indicators 1, 4, 5 and 6, and the first-year students surpass them in the other two indicators.

As evidence of this are the values of t, which are in favour of second-year students. However, as it can be seen from the figure, for indicators 1 and 4 (respectively "height" and

"body mass index") the values of the comparative criterion are lower than the critical one ($t_{tbl} = 1.91$). According to the norms of sports statistics, this gives reason, with a high guarantee probability (Pt over 95%), to confirm the zero hypothesis, according to which the observed advantage of the second-year students of UNWE in terms of height and chest circumference - respiratory difference is insignificant and can be explained by random reasons.

The same conclusion cannot be drawn for indicators 2, 3, 5 and 6 ("height").

From **Figure 1** it is clear that the t-criterion for these indicators is higher than the critical value ($t_2 = 2.83$; $t_3 = 4.02$; $t_5 = 2.1$; $t_6 = 2.04$). This means that the zero hypothesis can be rightly rejected here and the alternative to be adopted, according to which these indicators are better for second-year students, than the indicators of first-year economics students engaged in organized fitness.

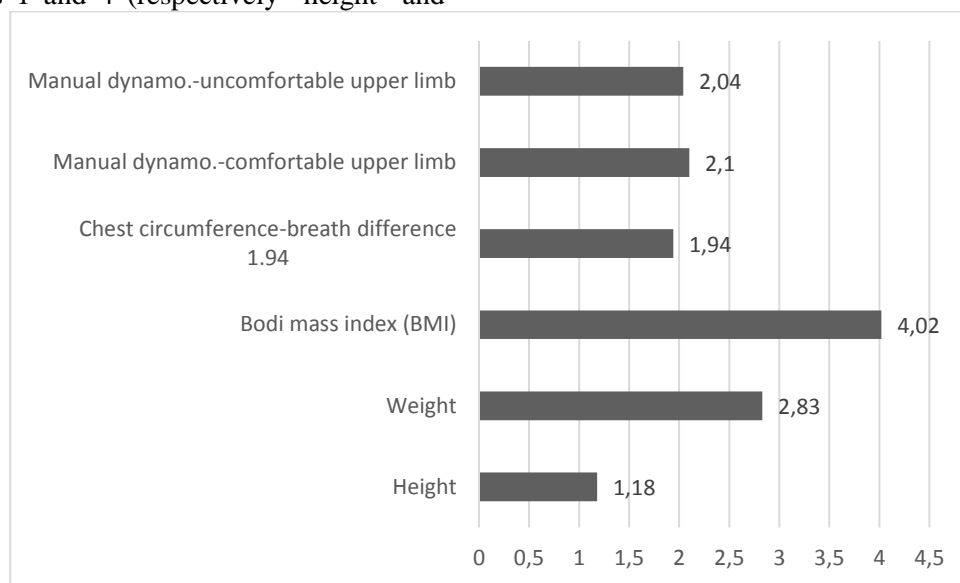


Figure 1. Significance of the differences between the average levels of the signs of the physical development of the students from the fitness groups from the second and first year of UNWE

The differences between the personal results of the studied signs of physical development affect the homogeneity of the studied groups of students, an indicator of which is the coefficient of variation - V. It carries important information about the study, characterizing the scattering of individual cases around arithmetic mean values.

As it can be seen from **Figure 2**, both studied populations are homogeneous in terms of the

height of the female students included in them. The analysis of the figure shows that indicator 1 ("height") is stable ($V_1 = 3.06\%$), and indicators 2 and 3 "weight" and "body mass index" - $V_2 = 14.00\%$ and $V_3 = 11.31\%$) are relatively stable. This gives grounds, with a high guarantee probability, to claim that the studied population is homogeneous in terms of the height of the girls and relatively homogeneous - in terms of the other two signs of physical development.

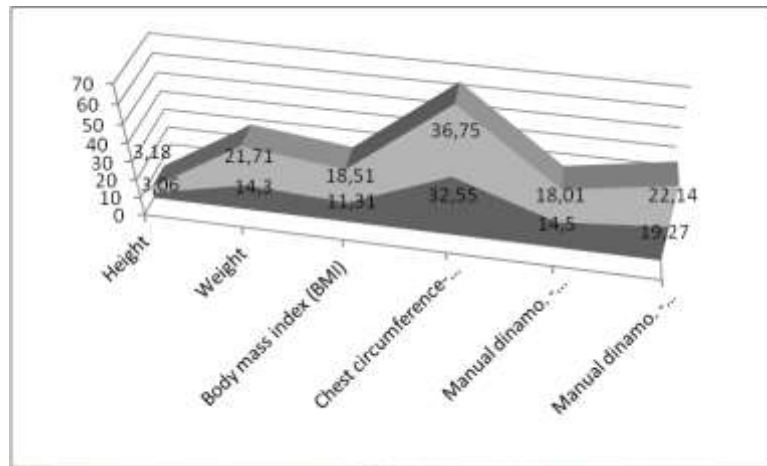


Figure 2. Scattering of the studied parameters

As it can be seen from **Figure 2**, in general, the scattering zone is limited within the relative stability (V (30%). Below 10% is the value of V in 1 of the studied indicators - height. Therefore, the indicator bearing information about it is stable.

The percentage of V values in four of the studied indicators is in the range of 11.31% - 19.27% for the group of second-year students and 18.01% -22.14% for the group of first-year students. This gives reason to believe that, in general, the groups are homogeneous and relatively homogeneous in terms of the studied signs of physical development and specific performance.

An exception and therefore inhomogeneity of the groups is observed only with respect to the level of development of:

- ✓ chest circumference - respiratory difference (indicator 4, V4 = 32.55% for second-year students and indicator 4, V4 = 36.75% for first-year students).

It makes the impression that the relative share of the surveyed second-year students with normal body weight, according to the applied scale, is 54%, respectively (**Table 3**). At the same time, a total of 46% of female students have abnormalities. The disturbing fact is that a total of 42% of them are underweight, 8% are in the area of "severe malnutrition" or "thinness", 4% of them are overweight (**Figure 3**).

Table 3. Weighting scale for ages 18-24

Age	Underweight	Normal Weight	Overweight	Obesity	Severe obesity
18 - 24	< 19	19 - 24	24 - 29	29 - 39	> 39

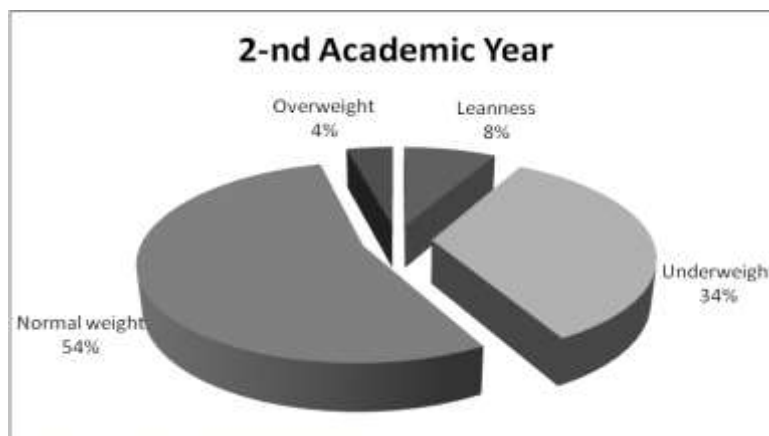


Figure 3. Relative shares of the degree of nutrition of female students from the 2nd year

Among first-year students (**Figure 4**), 52% are those of normal weight. It is noteworthy that the percentage of girls with deviations from normal weight is even higher, 48%.

Particularly worrying is the fact that unlike second-year students, here as many as 26% of surveyed students are overweight and 6% of them are obese.

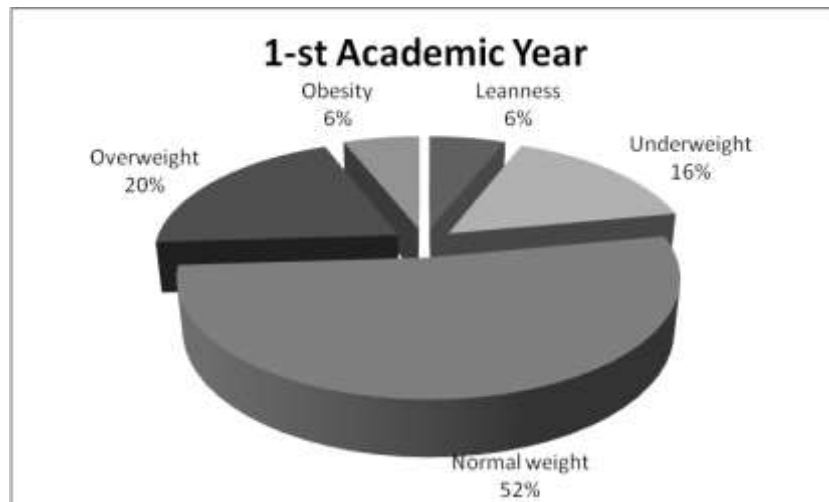


Figure 4. Relative shares of the levels of nutrition of female students from the 1st year

22% of first-year students are underweight, with 6% of them are in the "skinny" zone. Being underweight is just as unhealthy as being overweight. Regardless of whether the deviations in the weight of female students are above or below normal, they have a negative impact on physical development and will create problems in the performance of their professional duties in the future. The analysis of the variation tables presented above allows us to conclude that, in general, the assessment of this index according to the norms of sports medicine is within the norm - it ranges between 19.44 kg / m² in second-year students and 22.08 kg / m² - for first-year students at UNWE.

The evidence is the fact that between 54% and 52% of the students included in the surveyed groups has individual estimates in the range between 19 and 24 kg / m².

From the analysis of the above data we found that in the studied groups, although small in number, there are female students with a high level of development of morphofunctional qualities, suggesting high motor fitness. In support of this statement are some maximum values of indicators giving information about the static strength of the upper limbs and the functional capacity of the chest. Based on the analyzed data, we have reason to believe that the trends regarding the physical development

of female students are very disturbing and affect a large part of them.

CONCLUSIONS

The study concludes that the data of students practicing fitness with different experience are similar and this is a prerequisite to develop general guidelines for improving the methodology and organization of fitness training.

1. Just over half of the female students we surveyed - 53% have a body weight in the normal range. However, the high percentage of female students with a deviation from normal weight is alarming - 47%, with 32% being underweight, and 15% - overweight and even obese in 3% of female students.
2. Generally, it can be claimed that there are no large deviations from the average levels of signs of physical development of students in the fitness groups - 1st and 2nd year, which allows for the application of equivalent training intensity and also this is the reason for working in mixed groups.
3. Given that the future professional realization of these students is associated with a long stay behind a desk, which means immobilization, we recommend that teachers of physical education and sports in higher education to focus on training to create lasting habits and needs of students for active participation in various physical activities and sports.

REFERENCES

1. Tsarova-Vasileva, A., Comparative analysis of the physical development of students from the profiled swimming groups at the Technical University (Sofia). // *Sport and Science*, Issue 5, Sofia, pp. 153-160, 2015.
2. Chaney, S., Comparative analysis of the indicators of 17-19 year old handball players, 2018. *Sports and Science Magazine*, Book 5, S., pp.83-88, 2017.
3. <https://www.hhs.gov>
4. Ivanov, J., The educational component, B-ins, Sofia, 2006.
5. Kasabova, L., "Influence of special physical training on the technical and tactical skills of female students from specialized basketball groups.", Published by TU - Sofia, Sofia, pp. 17-18, 2019.
6. Milanova, St., Ignatova, M., Study of changes in anthropometric indicators in non-sports students. *Sports and Science Magazine*, Book 5-6, S., pp.143, 2016.
7. Georgiev Zh., Analysis of dynamics in the development of motor skills of students in the University of Forestry after the applied model for increasing physical ability. *Trakia Journal of Sciences*, Vol. 17, Suppl. 1, pp 668-675, Trakia University, Available online at: <http://www.uni-sz.bg>, doi: 10.15547 / tjs.s.01.108, 2019.
8. Kasabova, L., "Physical development and functional performance of female students at the beginning of their studies at UNWE", 2019, International Scientific Conference "Pedagogical Education-Traditions and Modernity", November 15-16, 2019. Veliko Tarnovo, ed. I AND BI, pp.552-558, 2019.
9. Stavrev, S., Tsvetkov, V., "Motor qualities and psychological characteristics necessary for practicing economic professions", *Sport and Science*, Sofia, Extraordinary issue 2. pp. 55-58, 2011.
10. Peltekova, I., Comparative analysis of the fitness abilities of students in "physical education and sports" at Sofia University "St. Kliment Ohridski"- Sofia, *Scientific and Methodological Magazine“ Sport and Science ”*, issue 2, Sofia, pp. 84-91, 2014.
11. Peltekova, I., Targeting development of the specific conditional qualities of the basketball students. *Trakia Journal of Sciences*, Vol. 17, Suppl. 1, Copyright © 2019 Trakia University, Available online at: <http://www.uni-sz.bg>, doi: 10.15547 /tjs.2019.s.01.120, pp 736-741, 2019.
12. Borukova, M., „Control of sports readiness of 13-14 year old basketball players", Sofia, Bolid Ins, pp. 17, 2018
13. Kasabova, L., "Physical development and functional performance of female students at the beginning of their studies at UNWE." 2019, International Scientific Conference "Pedagogical Education-Traditions and Modernity", November 15-16, 2019. Veliko Tarnovo, ed. I AND BI, pp.552-558, 2019.
14. Nestorov, Y., Changes in the anthropometric status of students of marine specialties during their studies in higher education. *Kinesiology*, I&B Publishing House, Veliko Tarnovo, pp 178-182, 2019.
15. Mavrudiev, P., Comparative analysis of the physical development of female students. // *Sport and Science*, issue 6, pp. 188-198, 2018.