



## ASSESSMENT OF THE LEVEL OF MOTOR PREPAREDNESS OF BULGARIAN AND FOREIGN STUDENTS TRAINING AT THE UNIVERSITY OF FORESTRY

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### ABSTRACT

The process of managing students' motor level requires solving tasks, such as measuring and evaluating basic qualities, and is the basis of pedagogical activity. The purpose of the study is to evaluate and compare the level of physical preparedness of newly admitted Bulgarian and foreign students. They chose to practice table tennis or volleyball. As a result of a conducting ascertaining pedagogical experiment, the input level of indicators, such as upper and lower extremity explosive strength, grip strength, abdominal muscle strength, the state of sensory systems and the neuromuscular apparatus, the ability of the spine to fold and etc. The results of the sports-pedagogical testing were obtained using mathematical-statistical processing, through a specialized program IBM "SPSS" 19 and "Excel". Variational and comparative analysis have been applied.

**Key words:** motor training, tests, University of Forestry, conclusions and recommendations

### INTRODUCTION

“Physical education as a general phenomenon must develop in accordance with modern changes in the educational process in universities, take into account the new trends in the development of various types of sports and the interests of students. It has a direct task of strengthening the health status of students and increasing their professional and general work ability“ (1).

“As is known, the student sports goal is the overall development of the physical qualities of students, which is a basic prerequisite for the more successful study and practice of a wider range of sports disciplines“ (2). “Physical education in universities is an integral part of education. The level of their physical preparedness and health, as well as their attitude to physical culture after completing the educational process, depends on

the quality of the organization and the conduct of activities with the students“ (3).

“Newly admitted students have a certain position about the role and importance of sports in higher education. Their attitude and opinion towards sports activities have been formed to a large extent. Sports education is a social factor for strengthening health, for all-round physical development, for stimulating work and mental capacity and, in general, for the overall education of students. In order to further expand sports activity and meet modern requirements, it is necessary to develop the sports interests of students“ (4).

According to G. Ignatov (2016), the quality and efficiency of education largely depend on the competence, motivation and resourcefulness of teachers (5). “In view to forming a positive attitude of young people towards a healthy lifestyle and sports activity, it is necessary to study and explore this issue in search of the correct and effective pedagogical solutions“ (6).

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“The intensifying competition and the dynamics of social development give rise to the need to continuously diversify the product of the offered educational services“ (7). “The low level of physical ability of students in Bulgaria gives a clear signal about the need for new scientific research in this area, application of modern and innovative programs, means and methods in sports activities at the universities“ (8). On the basis of analyzing of research on physical development and physical capacity in Bulgaria, the author St. Plyakov believes, that “the lack of systematic research and unified standards makes it hard to do a correct comparative analysis of the main factors determining the physical fitness of students. This calls for a future introduction of a unified system, such as Eurofit, already tested and applied in many member states of the European Union. This would enable, in addition to longitudinal comparisons within a single country, comparisons across countries, which is consistent with the new period and the concept of a European Community“ (9).

In this regard, comparing the motor preparedness of Bulgarian and foreign students is a very relevant question, which will give an answer as to whether corrections should be made in the curriculum of the discipline "Physical Education and Sports" at the University of Forestry.

## 1 Goal, tasks and methods of research

**1.1 The goal of the research** – Measuring and comparing the level of motor preparedness of Bulgarian and foreign 1st-year students studying at the University of Forestry.

### 1.2 Major tasks:

- 1.2.1 Theoretical substantiation of the problem;
- 1.2.2 To determine the level of motor preparedness of Bulgarian and foreign students 1st- year, from the specialty of Veterinary Medicine;
- 1.2.3 Variational and comparative analysis of the research indicators are to be applied;
- 1.2.4 Conclusions and recommendations are to be made in regards to overall practice.

**1.3 The object of research:** The research indicators' level among Bulgarian and foreign first-year students at the University of Forestry.

**1.4 The research contingent** consists of 87 first-year University of Forestry students from volleyball and table tennis groups, who are

distributed as follows:

1.4.1 Foreign students (FS) – 41 students from the specialty of Veterinary Medicine studying in English. They are from the following countries: Greece /28/; Turkey /4/; Russia /2/; Germany /1/; Ireland /1/; France /1/; UAE /1/; India /1/; Indonesia /1/ and Nigeria /1/.

1.4.2 Bulgarian students (BS) – 46 students from the specialty of Veterinary Medicine.

**1.5 Research methodology:** The pedagogical experiment was carried out in the "Bonsist" sports complex during the 2022-2023 academic year. We employed a test battery of eight tests to fulfill our objectives: (1) Standing long jump test (cm); 2) 3 kg medicine ball javelin (mm); 3) Handgrip strength test (kg); 4) Squats test (no./30 sec); 5) Sit ups test (no./30 sec); 6) T-test (sec); 7) Sit and reach test (cm); 8) Upper limb movement speed (25 no./sec). To determine the motor preparedness of the subjects, we used tests who have been taken from B. MacKenzie and Fleischman (10, 11).

The application of the above tests allows for the determination of levels of indicators such as: upper and lower extremity explosive strength, maximum grip strength, strength of the muscles of the front of the thighs and gluteal muscles, dynamic abdominal muscle strength, static passive and active flexibility of the back muscles, gluteal muscles, and the back of the lower limb and upper limb movement speed.

The sports-pedagogical testing results were obtained using mathematical-statistical processing, utilizing a specialist application IBM "SPSS" 19 and "Excel". Variational and comparative analysis have been applied.

## RESULTS ANALYSIS

The obtained results of the conducted research bring information about the motor preparedness of the students from the two studied groups. The values from the variation analysis for men are shown in **Table 1**.

According to the coefficient of variation, both groups are approximately uniform because they fall within the range  $10 < V < 30$ . The distribution of values is normal (K-S) – Sig.  $> 0,05$ , as only in the test “3 kg medicine ball javelin” the distribution among foreign students is not normal. The high standard deviation values of the “Standing long jump test” ( $S_{FS} = 37,09$ ;  $S_{BS} = 20,81$ ) and “3 kg

medicine ball javelin“ ( $S_{FS} = 159,61$ ;  $S_{BS} = 144,96$ ) are due to the large range (max.-min.) in both groups (Table 1).

**Table 1.** Values and variation analysis of the indicators of motor preparedness in the men`s groups

№	Indicator	n	Xmin	Kmax	R	$\bar{X}$	S	V	K-S	As	Ex
Foreign students - men	Standing jump	15	134	280	146	199,8	37,0	18,5	0,20	0,28	0,33
	Medicine ball	15	570	1030	460	774,5	159,	20,6	0,02	0,41	-
	Grip strength	15	32	60	28	45,20	8,30	18,3	0,20	0,25	-
	Squats	15	21	32	11	27,80	3,10	11,1	0,14	0,699	0,13
	Sit-ups	15	12	28	16	19,07	4,40	23,0	0,20	0,28	-
	T- test	15	10,3	20,9	10,5	14,14	2,55	18,0	0,20	1,18	2,62
	Sit and reach	15	22	43	21	30,93	6,52	21,0	0,20	0,23	-
	Movement	15	8,23	13,5	5,35	10,71	1,49	13,9	0,20	0,02	-
Bulg. students - men	Standing jump	14	183	251	68	219,4	20,8	9,48	0,20	0,334	-
	Medicine ball	14	425	980	555	713,7	144,	20,3	0,20	0,238	0,19
	Grip strength	14	34	64	30	46,71	9,49	20,3	0,20	0,54	-
	Squats	14	21	35	14	29,00	4,19	14,4	0,20	0,323	-
	Sit-ups	14	14	30	16	21,21	4,81	22,6	0,20	0,48	-
	T- test	14	11,3	17,1	5,87	13,10	1,92	14,6	0,05	1,38	1,05
	Sit and reach	14	18	48	30	36,50	7,94	21,7	0,20	1,104	1,22
	Movement	14	9,04	13,3	4,29	10,64	1,40	13,1	0,06	0,75	-

In the experiment that we conducted, we tested 26 foreign and 36 Bulgarian female students. The values from the variation analysis for women are shown in Table 2. According to the coefficient of variation, both female groups are approximately uniform because they fall within the range  $10 < V < 30$ . The distribution of values is normal according to Kolmogorov-Smirnova (K-S) – Sig.  $> 0,05$ , as only in the test „Maximum number of squats in 30 sec.”

the distribution among foreign female students is not normal.

As with the male groups, the standard deviation values were also high in the tests „Standing long jump“ ( $S_{FS} = 26,59$ ;  $S_{BS} = 24,04$ ) and “3 kg medicine ball javelin“ ( $S_{FS} = 88,57$ ;  $S_{BS} = 77,29$ ), which is due to the large range (max.-min.) in both studied groups (Table 2).

**Table 2.** Values and variation analysis of the indicators of motor preparedness in the women`s groups

№	Indicator	n	Xmin	Xmax	R	$\bar{X}$	S	V	K-S	As	Ex
Foreign female	Standing jump	26	91	204	113	153,08	26,59	17,37	0,160	-0,371	0,477
	Medicine ball	26	300	685	385	470,96	88,57	18,81	0,200	0,182	0,104
	Grip strength	26	20	40	20	29,27	5,50	18,78	0,200	0,096	-
	Squats	26	18	35	17	26,73	3,86	14,45	0,043	-0,198	0,728
	Sit-ups	26	11	26	15	16,92	3,69	21,79	0,200	0,491	0,118
	T- test	26	11,15	21,35	10,20	16,00	2,60	16,23	0,130	0,505	-
	Sit and reach	26	22	51	29	37,77	7,65	20,27	0,200	-0,238	-
	Movement	26	8,35	16,26	7,91	11,07	1,47	13,28	0,200	1,663	5,578
Bulg. female students	Standing jump	32	110	212	102	152,78	24,04	15,73	0,200	0,371	-
	Medicine ball	32	300	590	290	457,19	77,29	16,91	0,200	-0,063	-
	Grip strength	32	20	38	18	29,41	5,10	17,34	0,200	-0,003	-
	Squats	32	20	31	11	25,97	2,67	10,28	0,200	-0,073	-
	Sit-ups	32	14	24	10	18,59	2,83	15,20	0,200	0,151	-
	T- test	32	12,76	21,15	8,39	15,74	1,93	12,26	0,057	0,680	0,576
	Sit and reach	32	13	47	34	34,81	7,47	21,45	0,200	-0,653	0,921
	Movement	32	8,78	15,8	7,02	11,82	1,53	12,90	0,200	0,203	0,476

To evaluate and compare the level of motor preparedness of foreign and Bulgarian students, we used the Student's t-criterion for independent samples, with the differences at guaranteed probability being considered reliable  $P(t) \geq 95\%$ .

When comparing group average performance for males, only the "Sit and reach" test scores showed a statistically significant difference. The ability of the muscles of the back, buttock and back of the lower limbs to switch to a retreating mode of work is more developed in Bulgarian students, which is proven by  $P(t) = 95,182$  (Table 3).

**Table 3.** Comparative analysis of the indicators of motor preparedness in the men`s groups

Nº	Indicator	n	$\bar{X}$	S	R	t	$\alpha$	P(t)
1	Standing jump – FS	15	199,80	37,09	-19,63	-1,740	0,093	90,670
	Standing jump – BS	14	219,43	20,81				
2	Medicine ball – FS	15	774,53	159,61	60,82	1,072	0,293	70,660
	Medicine ball – BS	14	713,71	144,96				
3	Grip strength – FS	15	45,20	8,30	-1,51	-0,458	0,650	34,954
	Grip strength – BS	14	46,71	9,49				
4	Squats – FS	15	27,80	3,10	-1,20	-0,881	0,386	61,413
	Squats – BS	14	29,00	4,19				
5	Sit-ups – FS	15	19,07	4,40	-2,15	-1,256	0,220	78,026
	Sit-ups – BS	14	21,21	4,81				
6	T- test - FS	15	14,14	2,55	1,05	1,242	0,225	77,502
	T- test - BS	14	13,10	1,92				
7	Sit and reach – FS	15	30,93	6,52	-5,57	-2,070	0,048	95,182
	Sit and reach – BS	14	36,50	7,94				
8	Movement speed –	15	10,71	1,49	0,08	0,143	0,887	11,252
	Movement speed -	14	10,64	1,40				

**Table 4.** Comparative analysis of the indicators of motor preparedness in the women`s groups

Nº	Indicator	n	$\bar{X}$	S	R	t	$\alpha$	P(t)
1	Standing jump – FS	26	153,08	26,59	0,30	0,044	0,965	3,527
	Standing jump – BS	32	152,78	24,04				
2	Medicine ball – FS	26	470,96	88,57	13,77	0,632	0,530	47,019
	Medicine ball – BS	32	457,19	77,29				
3	Grip strength – FS	26	29,27	5,50	-0,14	-0,098	0,922	7,795
	Grip strength – BS	32	29,41	5,10				
4	Squats – FS	26	26,73	3,86	0,76	0,886	0,379	62,100
	Squats – BS	32	25,97	2,67				
5	Sit-ups – FS	26	16,92	3,69	-1,67	-1,953	0,056	94,423
	Sit-ups – BS	32	18,59	2,83				
6	T- test - FS	26	16,00	2,60	0,26	0,440	0,662	33,846
	T- test - BS	32	15,74	1,93				
7	Sit and reach – FS	26	37,77	7,65	2,96	1,483	0,144	85,630
	Sit and reach – BS	32	34,81	7,47				
8	Movement speed – FS	26	11,07	1,47	-0,76	-1,910	0,061	93,877
	Movement speed - BS	32	11,82	1,53				

For the rest of the indicators, there is no significant difference between the achievements of the two groups. The indicator "Standing long jump" giving information about the explosive

power of the lower limbs, shows that the Bulgarian students have an achievement of 19.63 cm better than that of the other group at  $P(t) = 90,670$ . Foreign students are superior to Bulgarian

students in terms of the explosive power of the upper limbs (indicator 2) and their result is 8.52% better. The close results in the other measurements give us reason to conclude that the examined persons from the two groups have approximately the same capabilities in terms of the indicators of motor preparedness chosen by us.

The data from the comparative analysis of the achievements of Bulgarian and foreign female students show that there are no statistically significant differences in the level of the studied indicators (**Table 4**).

In two of the tests, the difference is close to statistically significant - "Sit-up presses for 30 sec" (P(t) = 94.42%) and "Movement speed" (P(t) = 93.88%). Again, in the explosive force of the upper limbs (indicator 2), the foreign female students have a result of 13.77 cm better than that of the Bulgarian group. The lack of reliable differences between the values of the indicators we selected in the female groups, again shows approximately the same possibilities in terms of motor preparedness of this sample.

## CONCLUSIONS

1. The lack of statistically significant differences in the achievements of both men and women gives reason to assume that the methods used in physical education classes in Bulgarian schools are not inferior to those in other countries.
2. It turns out that the educational process in physical education in the school educational system only maintains the level of motor skills. The size and nature of the applied loads during general physical training do not lead to significant changes in the level of the basic motor qualities.
3. The heterogeneous composition of the study groups in terms of gender and motor abilities makes it difficult for the teachers to implement the tasks set down in the curriculum.
4. The curriculum of the discipline "Physical Education and Sports" for the specialty "Veterinary Medicine" can be successfully applied to foreign students without the need for changes in the part for general physical training.

## RECOMMENDATIONS

1. It would be useful to conduct similar research in other higher education schools in order to compare the level of motor preparedness of

Bulgarian students with that of foreign students as the number and types of tests can be changed.

2. It is necessary to develop a normative basis for assessing the motor preparedness of newly admitted students, annual testing to be conducted at the beginning of every academic year, as the obtained results to help teachers in the selection of additional exercises to develop relevant motor qualities. This has to be included in the curricula of the discipline "Physical education and Sport".
3. To increase the amount of the minimum differentiated financial support for physical activities, physical education and sport for the students in the system of higher education.
4. To increase the number of mandatory classes in Physical education and Sport in the University of Forestry in order to achieve a greater cumulative effect of the physical activities and thus increase the motor activity and health status of the students.

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