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ANALYSIS OF PHYSICAL PREPAREDNESS OF STUDENTS BASED ON THE RESULTS OF TESTS AND STANDARDS OF ANNUAL EVALUATION

Romana Sirenko[1], Yuriy Yaremchuk[1], Nataliia Semenova[2]

[1]Ivan Franko National University of Lviv, Lviv, Ukraine, romanaua@gmail.com
[2]Medical College of the Danylo Halytsky Lviv National Medical University, Lviv, Ukraine, semen.nataliia@gmail.com

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Abstracts

The article deals with the problem of physical preparedness of student youth of higher educational institutions of different levels of accreditation. Among the students of Ivan Franko National University of Lviv (n = 4636) and the Medical College at Danylo Halytskyi LNMU (n = 327) there were conducted tests and norms of the annual assessment of physical preparedness, which correspond to their age rating. The level of physical preparedness of the students of these universities according to gender, age and training courses is analyzed. The research made it possible to find out that first-year students of Ivan Franko National University of Lviv have a lower level of physical preparedness compared to senior students. Physical preparedness equals 34,47 % (male students) and 42,55 % (female students), which is considered to be at a low level. Among the students of the Medical College at Danylo Halytskyi LNMU, a decrease was observed in the number of students with a sufficient level of PP at 27 % and an increase of 30 % with an average level from I to IV course. Reduced qualitative assessment in test exercises for flexibility and running for short distances was observed. The low results were shown by female students of all courses of study in the following exercises: the jump in length from the place and the bending of the extension of the hands in the emphasis. It was established that sedentary lifestyle of students at university and medical college, which is observed in young students and often limited only to physical education classes at the university (2 hours per week),which is well below the needs of the young body and has a negative impact in terms of physical preparedness. The obtained results of students' PP should become an important factor in increasing the motivation of students to systematical training in physical culture and sports, as well as optimization of physical education at higher educational establishments.

Key words: physical preparedness, physical education, students, testing.

Романа Сіренко, Юрій Яремчук, Наталія Семенова. Аналіз фізичної підготовленості студентів на основі результатів тестів і нормативів щорічного оцінювання. У статті розглянуто проблему фізичної підготовленості студентської молоді вищих навчальних закладів різних рівнів акредитації. Серед студентів Львівського національного університету імені Івана Франка (n=4636) і Медичного коледжу ЛНМУ імені Данила Галицького (n=327) проведено тести й нормативи щорічного оцінювання фізичної підготовленості, що відповідають їхньому віковому цензу. Проаналізовано рівень фізичної підготовленості студентів зазначених ВНЗ за гендерною ознакою, віком та курсами навчання. Дослідження дало змогу виявити що студенти-першокурсники Львівського національного університету імені Івана Франка мають нижчий рівень фізичної підготовленості, порівняно зі студентами старших курсів. Фізична підготовленість 34,47 % досліджуваних чоловічої статі та 42,55 % студентів жіночої статі університету перебуває на низькому рівні. Серед студентів Медичного коледжу ЛНМУ імені Данила Галицького встановлено зниження кількості студентів із достатнім рівнем ФП на 27 % і зростання на 30 % – із середнім рівнем від I по IV курс. Отримано зниження якісної оцінки в тестових вправах на гнучкість та в бігу на короткі дистанції. Визначено низькі результати в студенток усіх курсів навчання у вправах «стрибок у довжину з місця й згинання-розгинання рук в упорі лежачи». Установлено, що малорухомий спосіб життя студентів університету та медичного коледжу, який спостерігаємо в студентської молоді, котра часто обмежується лише заняттями фізичним вихованням у ВНЗ (2 год на тиждень), що є значно нижчим від потреб молодого організму та негативно відображається на показниках фізичної підготовленості. Одержані результати ФП студентів мають стати важливим чинником у підвищенні мотивації студентів до систематичних занять фізичною культурою й спортом та оптимізації фізичного виховання у ВНЗ.

Ключові слова: фізична підготовленість, фізичне виховання, студенти, тестування.

Романа Сиренко, Юрий Яремчук, Наталья Семенова. Анализ физической подготовленности студентов на основе результатов тестов и нормативов ежегодного оценивания. В статье рассматривается проблема физической подготовленности студенческой молодёжи высших учебных заведений разных уровней аккредитации. Среди студентов Львовского национального университета имени Ивана Франко (n=4636) и Медицинского

колледжа ЛНМУ имени Данила Галицкого (n=327) проводятся тесты и нормативы ежегодного оценивания, физической подготовленности, соответствующие их возрастному цензу. Анализируется уровень физической подготовленности студентов указанных вузов по гендерному признаку, возрасту и курсам обучения. Исследование позволило выявить, что студенты-первокурсники Львовского национального университета имени Ивана Франко имеют уровень физической подготовленности ниже, по сравнению со студентами старших курсов. Физическая подготовленность 34,47 % студентов мужского пола и 42,55 % студентов женского пола университета находится на низком уровне. Среди студентов Медицинского колледжа ЛНМУ имени Данила Галицкого установлено снижение количества студентов с достаточным уровнем ФП на 27 % и прирост на 30 % – со средним уровнем с I по IV курс. Получено снижение качественной оценки в тестовых упражнениях на гибкость и в беге на короткие дистанции. Определены низкие результаты у студенток всех курсов обучения в упражнениях «прыжок в длину с места» и «сгибание-разгибание рук в упоре лёжа». Установлено, что малоподвижный образ жизни студентов университета и медицинского колледжа, который наблюдается у студенческой молодежи и часто ограничивается лишь занятиями физическим воспитанием в вузе (2 часа в неделю), что значительно ниже потребностей молодого организма и негативно отражается на показателях физической подготовленности. Полученные результаты ФП студентов должны стать важным фактором в повышении мотивации студентов к систематическим занятиям физической культурой и спортом и оптимизации физического воспитания в вузе.

Ключевые слова: физическая подготовленность, физическое воспитание, студенты, тестирование.

Introduction. An important problem in the life of student youth at the present stage of development of society is the preservation and strengthening of health, increased physical activity, overcoming hypokinesia, adherence to the foundations of a healthy lifestyle, which, according to experts, is unquestionably interconnected [3; 5]. The research of scientists proves that physical preparedness is one of the criteria of health, and in the practice of physical education of students in higher educational institutions -- the main criterion for its effectiveness, development of physical qualities, the formation of motor skills, health promotion and future professional activities [1; 4; 6]. Scientists argue that the definition of the level of physical preparedness is a necessary component of the process of pedagogical control in physical education [2]. The conduction of which helps to optimize the process of physical education at educational institution.

In order to implement the «National Strategy for Motor Rehabilitation in Ukraine until 2025 «Motor activity – healthy lifestyle – healthy nation», the Cabinet of Ministers of Ukraine adopted the Decree No. 1045 since December 9, 2015 «On Approval of the Procedure for conducting an annual assessment of physical preparedness among the population of Ukraine».

Ministry of Youth and Sports of Ukraine by order dated 15.12.2016 № 4665 «On approval of tests and standards for conducting an annual assessment of the physical preparedness of the population of Ukraine» approved tests and standards, as well as instructions for organizing an annual assessment of physical preparedness of the population of Ukraine. For pupils and students, the process of testing physical preparedness (PP) is mandatory.

The purpose of the research is to determine and analyze the level of physical preparedness of students of Ivan Franko National University of Lviv (hereinafter referred to as university) and the Medical College of the Danylo Halytskyi National Medical University Lviv (hereinafter referred to as college).

Materials and methods of the research. Physical preparedness of students was evaluated on the quality of performing test exercises approved by the order of the Ministry of Youth and Sports of Ukraine by order dated December 15, 2014, No. 4665. The tests in both higher educational establishments were conducted during two academic classes according to the schedule. At the university during the first class, there was a test in running, distance: 100 m, jump in length, running at the distance of 3000 m (for male students) or 2000 m (for female students); during the second class – pull-ups on the bar (male students) or bending and extension of hands in the laying emphasis (female students), shuttle running, distance 4x9 m, the body tilt forward from the sitting position. In the college, on the first day of the test, students aged 15 years were running 60 m, others – 100 m, jump in length, running 2000 m (boys 15–16 years) or females from 17 years old, 1500 m (girls aged 15–16 years), 3000 m (males from 17 years old); On the second day of testing – pull-ups on the bar (males) or bending and extension of hands in the lying emphasis (female), shutter running, distance 4x9 m, the body tilt forward from the sitting position.

4,636 students of the Ivan Franko National University of Lviv were admitted to physical preparedness testing, of which 1559 were males, and 3077 were females. At all courses of study, «Physical education» takes place in the amount of 2 hours per week. During the first course as a normative educational discipline, during II–IV courses as a discipline for a student's free choice.

Physical education in college for students who entered the basic general secondary education is conducted in the amount of 2 hours per week at the first and second year, at the third, fourth year, and for the students who entered the college on the basis of complete secondary education, have 4 hours of Physical Education classes per week, except for the last semester.

In the medical college, 375 students are enrolled, of which 327 were admitted to testing: 301 female and 26 male.

Research results. Discussion. The analysis of the data obtained among the university students allowed us to establish that the students of the first year have a significantly lower level of physical preparedness than the senior students (Table 1). The most significant differences in the results of the tests are observed in the cross running at the distance of 3000 m. It should be noted that the endurance of the students of the first year is low, while the endurance of the students of the university of senior courses did not have significant differences and is within the intermediate level.

Table 1

Indices of physical preparedness of male students of Ivan Franko National University of Lviv (X±δ)

Course	Testing				
	3000 м (min, sec)	**Jump in length (cm)**	**100 м (sec)**	**Shuttle running (sec)**	**Bending of the body in sitting position (cm)**
I	15,27 1,76	210,0 17,5	14,18 0,1	9,80 0,03	8,2 0,8
II	14,06* 1,7	216,0 19,4	14,68* 0,05	9,92 0,04	11,0 * 0,6
III	14,02* 0,98	227,0 16,5	14,16 0,08	9,57 0,05	9,5 0,4
IV	14,26* 1,56	229,0 17,0	14,09 0,07	9,50 0,02	10,8 * 0,5

Note: * - the differences between groups are reliable at p <0,05.

Testing of high-speed properties of university students showed satisfactory results (qualitative assessment of 3 points). The lowest rates of speed were for second-year students. In jumps in length from place, the lowest results (at a rate of 2 points) of 210 ± 17.5 cm were shown by freshmen students. The highest average group results were observed in IV year students – 229 ± 17.0 cm. However, qualitatively this is also an unsatisfactory result (2 points).

The highest rates in male students were observed in skills tests (shuttle running 4x9 m) and flexibility. The qualitative indicators were satisfactorily and good.

Indices of physical preparedness of university students are shown in the table 2.

Table 2

Indices of physical preparedness of female students at Ivan Franko National University of Lviv (X±δ)

Course	Testing				
	2000 м (min, sec)	**Jump in length (cm)**	**100 м (sec)**	**Shuttle running (sec)**	**Bending of the body in sitting position (cm)**
I	13,01 2,78	166,0 16,0	17,45 0,09	11,08 0,04	15,8 0,8
II	12,46* 2,68	174,0 12,7	17,51 0,07	11,12 0,06	16,2 0,5
III	12,55* 2,27	176,0 15,5	16,56* 0,08	10,94 0,05	19,0* 0,4
IV	12,20* 3,47	172,5 13,9	16,47* 0,10	10,49* 0,04	18,8 * 0,6

Note: * - the differences between groups are reliable at p <0,05.

In the tests of endurance in females, there was a significant divergence of results in the run of 2000 m. The lowest average group figures were recorded in the first year students. It should be noted that 54.5% of first year students overcame distances of 2000 meters for a longer period than 12 min. and 30 seconds and got an unsatisfactory score of 0 points. Only 3.4% of students ran a distance to an excellent score of 5 points.

In our opinion, this is an extremely threatening situation, which shows that the number of female students with a reduced level of health is growing, as one can draw a parallel between endurance and the functional state of the body of women.

In the testing of speed-power and speed capabilities, a similar dynamics was observed. The results of the tests were in the low and intermediate level (jump in length from place) and low level (running at 100 m).

In jumps in length, 41.3% of students showed a result below 165 cm and scored 0 points. Even more alarming is the situation in running at 100 m, where the result of 0 points ran 58.8% of test participants.

In women, the same tendency was observed in the testing of speed and flexibility, as in men. These tests were the easiest for female students and the qualitative evaluation ranged between 3-4 points.

Table 3 shows the results of testing physical preparedness levels.

Table 3

Levels of physical preparedness among students of the university

Course	Sex	Level of preparedness, %			
		high	good	intermediate	low
I	Male.	6,60	19,34	30,42	43,63
	Female.	1,49	10,92	31,84	55,75
II	Male.	10,8	27,02	21,62	40,54
	Female.	1,98	5,94	39,60	52,48
III	Male.	16,67	19,44	41,67	22,22
	Female.	0,82	17,65	56,04	25,49
IV	Male.	17,46	18,22	32,82	31,50
	Female.	1,39	17,22	44,92	36,47
Total	Male.	12,88	21,01	31,63	34,47
	Female.	1,42	12,93	43,10	42,55

As can be seen from Table 3 in the first-year students, there is a significantly lower number of people with a high level of preparedness compared to senior students. This is especially noticeable in men. Also, the number of people with a low level of preparedness (up to 43.63%) has increased among representatives of a strong sex.

In female students, the highest percentage of people with a low level of preparedness is observed on the first year of study.

Comparison of the results of testing students of different courses at the medical college was not possible, hence college students start their education at the age of 15 and the tests for determining speed and endurance differ. Only in the 3rd and 4th year students, tests do not differ.

Female students of the first year, aged 15 years (n = 71), on the average showed an «good» level of physical preparedness that exceeded 16.6 points, which corresponds to mark: «good» according to assessment of the level of physical preparedness (Table 4).

Table 4

Indices of physical preparedness of female students aged 15 years in the Medical College at Danylo Halytskyi LNMU (X±δ)

Testing					
1500 м (min, sec)	Jump in length (cm)	60 м (sec)	Shuttle running 4x9 м (sec)	Bending of the body in sitting position (cm)	PP score (points)
9,78±1,44	159,05±22,09	10,67±1,03	11,12±0,65	11,92 ± 8,54	16,6 «good»

Among 15 years old female students, eight have performed exercises for determining strength: bending and extension of arms in laying emphasis. Three female students completed this test for «excellent», two for «good», one for «satisfactory» and two for «unsatisfactory» scores.

Male students, aged 15 years (n = 7), on average, showed «good» level of physical preparedness that exceeded 17.8 points, which corresponds to a «good» assessment of the level of physical preparedness (Table 5).

Table 5

Indices of physical preparedness of male students aged 15 years in the Medical College at Danylo Halytskyi LNMU (X±δ)

Testing					
2000 м (min, sec)	Jump in length (cm)	60 м (sec)	Shuttle running 4x9 м (sec)	Bending of the body in sitting position (cm)	PP score (points)
9,96±0,85	205,8±30,26	9,58±0,59	9,97±0,92	5,67±3,27	17,8 «good»

Among the first-year female students of the age of 15 years, the lowest results were obtained at a run of 1500 m and a jump in length from place. Among the male students of this age, the lowest results were obtained in running at 2000 m and bending of the body in sitting position.

Female students of the 1st and 2nd year, at the age of 16 years (n = 67), on average showed an «average» level of physical preparedness that exceeded 15.2 points, which corresponds to the assessment score: «satisfactorily» by the level of physical preparedness. Among 16 years old female students twenty nine performed exercises for determining strength: bending and extension of arms in laying emphasis. The average result in this exercise was 11.68 ± 5.19 repetitions, which corresponds to the «low» level. Female students who performed the jump in length from the place also showed a «low» score (Table 6).

Table 6

Indices of physical preparedness of female students aged 16 years in the Medical College at Danylo Halytskyi LNMU (X±δ)

Testing					
1500 м (min, sec)	Jump in length (cm)	100 м (sec)	Shuttle running 4x9 м (sec)	Bending of the body in sitting position (cm)	PP score (points)
9,56±1,47	163,69±17,43	17,37±1,15	11,09±0,58	14,0±6,64	15,24 «satisfactory»

Male students, aged 16 and over (n = 5), except for the test of flexibility, practically completed each test with 4 points and demonstrated a level of «intermediate» «good», but bending of the body sitting position only one student performed with «excellent» mark, while others demonstrated an «unsatisfactory» state of flexibility.

PP indices were obtained among the female students of the third and the second year, who reached the age of 17 years (n = 99) and fourth year (n = 70), allowed to establish the «intermediate» level of PP with score - «satisfactory» of both groups of female students. (Table 7).

A comparative analysis of the data obtained revealed that there were no significant differences between the results of the tests performed by the second-third year female students at the age of 17 and students of the fourth year of study.

To determine the level of development of the strength of 60 female students of the third year and 50 students of the fourth year, they selected the exercise of bending and extension of arms in laying emphasis, the obtained data averaged 13–14 repetitions in both courses, and the evaluation of PP was unsatisfactory.

In the process of performing test exercises, male students of the third year (n = 14) demonstrated a sufficient level of physical preparedness (Table 8).

Table 7

Indices of physical preparedness of female students aged 17 years, III, IV courses at the Medical College at Danylo Halytskyi LNMU (X±δ)

Course	Testing					
	2000 м (min, sec)	**Jump in length (cm)**	**100 м (sec)**	**Shuttle running 4x9 м (sec)**	**Bending of the body in sitting position (cm)**	**PP score (points)**
II, III	12,45±1,75	163,71±14,13	17,16±1,71	11,16±0,99	13,06±6,50	14,36 «satisfactory»
IV	12,28±1,29	158,55±21,84	17,02±1,20	11,36±1,01	13,97±6,67	13,98 «satisfactory»

Table 8

Indices of physical preparedness of male students aged 17 years of the third year at the medical college at Danylo Halytsky LNMU (X±δ)

Testing					
3000 м (min., sec.)	Jump in length (cm)	100 м (sec.)	Shuttle running 4x9 м (sec.)	Bending of the body in sitting position (cm)	PP score (points)
13,36±2,28	201,07±28,79	15,02±0,91	9,69±0,64	8,80±5,15	16,07 «good»

However, it should be noted that the lowest rates, which corresponded to unsatisfactory evaluation of PP, were obtained in exercises: a jump in length from the place and bending of the body in sitting position.

In the fourth year there is only one male student, whose level of physical preparedness was equal to 18 points, corresponds to a sufficient level, the level of PP is «good».

Among the students of the medical college with a «high» level of PP in the 1st year, 14 % of students were identified, in the 2nd – 6 % of students, in the 3rd – 5 %, and in the fourth course, this indicator dropped to 3 %. From I to IV courses, the number of students with «sufficient» level of PP dropped significantly from 48 % to 21 % and the number of students with the «average» level of PP increased by 30 %.

The obtained results of the annual testing of physical preparedness of students of Ivan Franko National University of Lviv and Medical College at Danylo Halytskyi LNMU and their analysis allow to claim about the negative impact of the slow-moving lifestyle of university students and medical college, which is observed in student youth on indices of physical preparedness that is undeniably reflected on the condition of their physical health. After all, motor activity of students is often limited to physical education at higher education institutions (2 hours per week), which is significantly lower than the optimal quantity and needs of the young organism. The obtained results of students' PP should become an important factor in increasing the motivation of students to systematically practice physical culture and sport, also optimize physical education in higher education.

Conclusions. It is established that freshman students of Ivan Franko National University of Lviv have a lower level of physical preparedness compared to senior students. PP of more than a third of university students are at a low level. Data on reducing the number of medical college students with a sufficient level of PP by 27%, reducing the qualitative assessment in exercise tests on flexibility and running in short distances are obtained. The obtained results of PP students are an important factor in increasing the motivation of students for further self-improvement, positive attitude towards systematic practices of physical culture and sport, and increasing the extent of their motor activity. This will allow teachers of physical education to identify the advantages and disadvantages of applied means, teaching methods and forms of conducting classes, based on their analysis, adjust the curriculum.

The prospects for further research are the comparative analysis of the dynamics of the indicators of the annual determination of the physical preparedness of students of higher educational institutions of different levels of accreditation.

References

1. Koriahin V. M., Blavt O. Z., Mudryk I. P. (2012). Do pytannia stanu zdorovia studentiv VNZ [To the issue of the state of health of students of universities]. Psykholohichni, pedahohichni ta medyko-biolohichni aspekty fizychnoho vykhovannia: materialy III Mizhnarodnoi elektronnoi naukovo-praktychnoi konferentsii. Odesa, 65–68.
2. Rymar O., Solovei A. (2013). Otsiniuvannia rivnia fizychnoi pidhotovlenosti uchniv starshykh klasiv [Assessment of the level of physical preparedness of high school students]. *Moloda sportyvna nauka Ukrainy : zb. nauk. pr. z haluzi fiz. vykhovannia, sportu i zdorovia*, Vyp. 17, t. 2, 181–186.
3. Sirenko R. R. (2006). Vplyv rukhovoi aktyvnosti na motyvatsiiu do samostiinykh zaniat fizychnymy vpravamy studentiv vyshchykh navchalnykh zakladakh [Influence of motor activity on the motivation for independent exercises by physical exercises of students of higher educational establishments *Pedahohika, psykholohiia ta medyko-biolohichni problemy fizychnoho vykhovannia i sportu: zb. nauk. pr.*, no. 4, 161–164.
4. Iudenok V. M. (2015). Doslidzhennia rivnia fizychnoi pidhotovlenosti studentiv 1–4 kursiv vyshchoho navchalnoho zakladu [Study of the level of physical fitness of students 1–4 years of higher education]. *Naukovij chasopis seriya 15 «Naukovo-pedagogichni problemi fizichnoyi kulturi fizichna kultura i sport» zb. naukovih prac / Za red. O. V. Timoshenka,* K.: Vid-vo NPU imeni M. P. Dragomanova, vyp.3 K1 (56) 15, 401–404.
5. Beata Rogo (20017). Styl życia studentek a ich sprawność fizyczna // Choroby XXI wieku : wyzwania w pracy fizjoterapeuty / pod red. nauk. Marzeny Podgórskiej Adres wydawniczy: Gdańsk : Wydawnictwo Wyższej Szkoły Zarządzania, 33–52. Rezhym dostypu: http://www.wsz.pl/wp-content/uploads/2014/06/chxxiw.pdf
6. Semenova N., Ripak M., Chekhovska L. (2017). Lifestyle of Students Studying in the Specialty «Nursing» Fizychne vykhovannia, sport i kultura zdorovia u suchasnomu suspilstvi : zb. nauk. pr. Skhidnoievrop. nats. un-tu im. Lesi Ukrainky, Lutsk: Skhidnoievrop. nats. un-t im. Lesi Ukrainky, no. 2, 131–134. Rezhym dostypu: http://nbuv.gov.ua/UJRN/Fvs_2017_2_25.

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