

# Body as a factor of individualization of physical education lessons of university students

UDC 796

PhD, Associate Professor **T.V. Bushma**<sup>1</sup>PhD, Associate Professor **O.V. Mironova**<sup>2,3</sup>PhD, Associate Professor **A.V. Sharonova**<sup>4,5</sup>**I.L. Bondarchuk**<sup>1</sup><sup>1</sup>Peter the Great St. Petersburg Polytechnic University, St. Petersburg<sup>2</sup>Bobkov Saint Petersburg branch of Russian Customs Academy, St. Petersburg<sup>3</sup>Saint Petersburg State University, St. Petersburg<sup>4</sup>Russian State Hydrometeorological University, St. Petersburg<sup>5</sup>The State Institute of Economics, Finance, Law, and Technology, Gatchina

Corresponding author: mironova.olga2014@gmail.com

## Abstract

**Objective of the study** was to development and approbation of means of physical culture in the interests of increasing the level of physical fitness of students, depending on the type of physique.

**Methods and structure of the study.** The development was carried out on the basis of three universities in the period from 2020 to 2021 St. Petersburg and the Leningrad region. In the course of the work, indicators of physical development, physical fitness of the contingent and body types of students (230 people) were determined according to the traditional method. Constant monitoring of indicators of physical fitness, attendance and motivation for physical culture and sports was carried out.

**Results and conclusions.** As a result of the development, the method of individualization of physical culture classes of students based on their typological characteristics was substantiated and tested, which contributed to an increase in the level of physical fitness and had a positive effect on the effectiveness of the process. The result is a pronounced effect of the program on students of the hypersthenic type, which is reflected in a greater percentage of satisfactory results when passing control exercises compared to other typological groups.

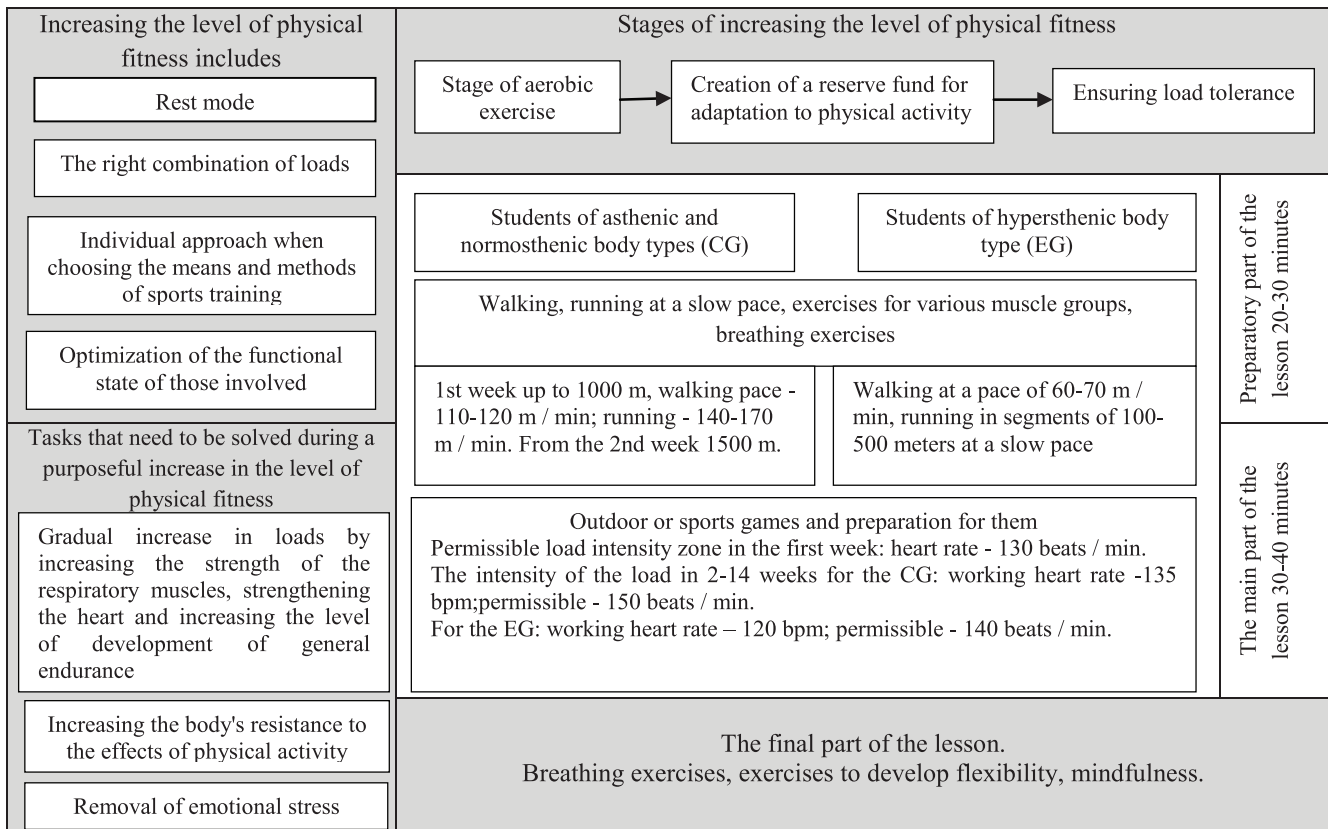
**Keywords:** *students, physical development, physical training, physical activity, body type, methodology.*

**Introduction.** The analysis of modern researches in the field of physical culture of students, presented in the scientific literature, is characterized to a large extent by the level of the functional state of those involved, anthropometric indicators and the development of mental qualities, motivational bases of the process, etc. [1,4]. As practice shows, in each educational institution there is a certain percentage of students who perform control exercises for a minimum score or even below the threshold established by the discipline program [5,6]. Insufficient level of physical fitness is a special state of the body, which is due to a weak systemic relationship between the components of physical fitness, as well as the "lag" of its individual elements [2,3,7,8]. Statistical data indicate that more than 80% of students with a low level of physical fitness have a hypersthenic body type, which makes it difficult to achieve the normative indicators of the physical education training process [7].

The creation of individual educational routes in the paradigm of modern education occupies a key place in increasing the effectiveness of training and achieving the maximum educational effect. Due to the prevailing nature of hypersthenic students who are lagging behind in physical culture, we see it relevant to substantiate special programs for accounting for the objective characteristics of this contingent in order to select physiologically and functionally justified individualized means of pedagogical influence.

**Objective of the study** was to development and approbation of means of physical culture in the interests of increasing the level of physical fitness of students, depending on the type of physique.

**Methods and structure of the study.** An analysis of the level of physical fitness of 230 students was carried out in 2020-2021. on the basis of Peter the Great St. Petersburg Polytechnic University, St. Petersburg State University and the State Institute of Economics,



*Methodology for increasing the level of physical fitness of students*

Finance, Law and Technology. Trainees with a satisfactory level of physical fitness were divided into control (CG) and experimental (EG) groups. The CG included students of asthenic and normosthenic body types, and the EG students of hypersthenic type.

To assess the effectiveness of the experimental program of the study, indicators of physical development, physical fitness, mode of physical activity, as well as the dynamics of these indicators were determined.

Results of the study and their discussion. Based on the analysis of scientific and methodological literature, a survey of teachers of St. Petersburg State University and the State Institute of Economics, Finance, Law and Technology in the framework of the use of means and methods of general physical training of students with a satisfactory level of physical fitness, an experimental methodology was developed using the principle of group individualization (see picture).

The basis of the experimental program was aerobic exercises, which favorably affect the formation of the necessary adaptive changes and reduce excess weight. No less important place was occupied by the issues of nutrition and maintaining a sufficient motor

regime in the weekly cycle. The forms of self-control and counseling were updated. To reduce monotony and maintain motivation, aerobic activities included outdoor and sports games.

The use of aerobic exercise, especially at the initial stage of the experiment, contributed to the development of endurance, weight loss through the use of energy carbohydrate and fat sources, which created the necessary physiological basis for increasing physical activity in the future. At this stage, in planning the training of students of the hypersthenic type, exercises of moderate power and longer rest intervals were used, allowing students to fully restore their working capacity before performing the next exercise. A special place was occupied by exercises to strengthen the musculoskeletal system. In the course of theoretical classes, competencies in a healthy lifestyle (HLS) and the physiological foundations of training were formed.

At the second stage, due to the increase in the volume of physical activity and its direction, there was an increase in the functional capabilities of the trainees, which made it possible to improve the working capacity of the trainees through the formation of basic adaptive attitudes to physical loads close in magnitude to



## Change in the studied indicators of students for the period of the experiment

Indicators	Group	Start experiment	End of experiment	$\bar{X}_2 \pm \bar{X}_1$	$\Delta$
		$\bar{X}_1 \pm m_1$	$\bar{X}_2 \pm m_2$		
100 m run, s	EG	13,66±0,40	13,21±0,25	-0,45	*
	CG	13,63±0,41	13,58±0,43	-0,05	
3000 m run, s	EG	778,60±33,04	715,23±37,16	-62,32	**
	CG	777,55±33,01	772,18±34,26	-5,37	
Pull-ups on the bar, times	EG	14,88±2,64	16,42±2,48	1,54	*
	CG	14,91±2,63	15,22±2,61	0,31	

Note: \*\* –  $p < 0,01$ ; \* –  $p < 0,05$ .

the level of loads characteristic of students with good and excellent levels. physical fitness. In addition, all this together made it possible to apply more intense loads that contribute to the inclusion of fat sources in the energy regime to ensure physical work, which is important for the hypersthenic type. At this stage, special attention was paid to the observance of the rules of balanced and proper nutrition, observance of work and rest regimes.

The third stage was characterized by the provision of resistance to increased intensity of loads. During this period, strength exercises were also included in the classes, since if there is sufficient preparedness for hypersthenics, this type of exercise is no less important than aerobic exercise. In the process of strength training, the muscles use glucose, which they are able to extract from the blood circulation in a non-insulin way. In addition, the level of general exchange also increases. The program involved the use of strength exercises with their own weight or light weights, but using a large number of repetitions. In this part, the interval training method was used.

One of the important features of the proposed methodology of physical exercises was the use of various means that aroused interest among those involved, the creation of a positive emotional background. At the same time, the factor of accessibility of physical activity to the condition of those involved, control and self-control over the recovery process, excluding overwork, contributed to the achievement of a positive pedagogical effect. This is consistent with the provisions of the theory and practice of physical culture regarding the adequacy of the applied means and methods to the physical condition of those involved, not leading to their overwork, contributing to the normalization or improvement of body functions, and also taking into account individual typological features [1-5].

The dynamics of the level of physical fitness of students for the experimental period is presented in the table.

Changes in the level of physical fitness occurred only in the EG. In the 100 m run, the improvement was 0.45 s (at  $p < 0.05$ ), in the pull-ups on the crossbar - an improvement of 1.54 times (at  $p < 0.05$ ), in the 3000 m run - the improvement was 62, 32 s (at  $p < 0.01$ ).

**Conclusions.** The results of the conducted research indicate that in the classroom with students with a satisfactory level of physical fitness, related to the hypersthenic body type, it is advisable to rationally dose the load and smoothly increase it, especially at the initial stage of the predominantly uniform method. This made it possible to form the basis for the formation of a higher level of basic adaptive attitudes. The formation of persistent functional shifts that allow training without sharp responses from the body is an advantage of the experimental method of training with students of hypersthenic body type.

The use of physical culture means in the program, which increase the emotional background of classes, as well as the formation of competencies to maintain a healthy lifestyle, contributed to the depressing effect of monotony and increased motivation of those involved. The initial focus on the individualization of physical activity (individually optimal pace, sufficient duration of rest pauses between loads, special standardization of loads in a series) favored an increase in the level of development of students' physical fitness, including general endurance, and also allowed the body of those involved to quickly adapt to a stepwise increase loads.

According to the data of the students' survey after the end of the experiment, the individualization of the process of physical culture had a positive effect on their familiarization with the systematic physical culture and an increase in the volume of physical activity.



## References

1. Baturin A.E., Kovalenko V.N., Katkov A.E. Uchet somatotipov studentov pri vybore sredstv i metodov fizicheskoy kultury [Consideration of students' somatotypes when choosing means and methods of physical culture]. *Pedagogicheskiy zhurnal*, 2019. Analitika Rodis. Vol. 9. No. 3-1. pp. 103-111.
2. Bakhtin T.N., Lesheva N.S. Monitoring fizicheskoy formy studentov pervogo kursa sankt-peterburgskogo gosudarstvennogo lesotekhnicheskogo universiteta imeni S.M. Kirova [Monitoring of the physical form of first-year students of St. Petersburg State Forest Engineering University named after S.M. Kirova]. *Aktualnyye problemy, sovremennyye tendentsii razvitiya fizicheskoy kultury i sporta s uchetom realizatsii natsionalnykh proyektov* [Actual problems, modern trends in the development of physical culture and sports, taking into account the implementation of national projects]. Proceedings national scientific-practical conference with international participation. Moscow, 2021. pp. 27-32.
3. Katkov A.E., Kovalenko V.N., Sklyarova I.V. et al. Metodika differentsirovannoy trenirovki studentov, imeyushchikh nizkiye pokazateli v bege na 3000 metrov [Methods of differentiated training of students with low performance in running 3000 meters]. *Uchenye zapiski universiteta im. P.F. Lesgafta*. 2019. No. 11 (177). pp. 155-160.
4. Lobanov Yu.Ya., Mironova O.V., Tokareva A.V. et al. Metodika podgotovki studentov s nizkim urovnem fizicheskoy podgotovlennosti k vypolneniyu normativov VFSK GTO [Methods of training students with a low level of physical fitness to fulfill the standards of the VFSK GTO]. *Uchenye zapiski universiteta im. P.F. Lesgafta*. 2017. No. 9 (151). pp. 170-174.
5. Lobanov Yu.Ya., Kovalenko V.N., Mironova O.V. et al. Metodika trenirovki studentov s nizkim urovnem fizicheskoy podgotovlennosti [Methods of training students with a low level of physical fitness]. *Uchenye zapiski universiteta im. P.F. Lesgafta*. 2018. No. 2 (156). pp. 126-130.
6. Lobanov Yu.Ya., Kovalenko V.N., Mironova O.V. et al. Kharakter proyavleniya fizicheskikh kachestv v zavisimosti ot tipologicheskikh osobennostey konstitutsii studentov [The nature of the manifestation of physical qualities depending on the typological features of the constitution of students]. *Uchenye zapiski universiteta im. P. F. Lesgafta*. 2018. No. 2 (156). pp. 122-126.
7. Fofanov A.M., Kovalenko V.N., Kotov P.A. Fizicheskaya podgotovka kursantov vuzov Sukhoputnykh voysk Vooruzhennykh Sil Rossiyskoy Federatsii v XXI veke [Physical training of cadets of universities of the Land Forces of the Armed Forces of the Russian Federation in the XXI century]. 2020. No. 1. St. Petersburg: VIFK publ., pp. 29-33.
8. Yarchikovskaya L.V., Sharonova A.V., Ustinova O.N. Upravleniye predezamenatsionnym sostoyaniyem studentok sredstvami i metodami fizicheskogo vospitaniya [Management of the pre-examination state of female students by means and methods of physical education]. *Teoriya i praktika fizicheskoy kultury*. 2020. No. 6. pp. 29-31.