

# Features of change of condition of a biogeometrical profile of bearing of students in the course of physical education

**Sergey Lopacki**

*Ivano-Frankivsk national medical University,  
Ivano-Frankivsk, Ukraine*

**Purpose:** to study features of condition of a biogeometrical profile of bearing of students in the course of physical education.

**Material & Methods:** 401 students of the 1–4 courses who are studied on a day form of education took part in the research. The following methods of research were used for the performance of the given tasks: analysis of scientific and methodical literature and documentary materials; pedagogical supervision; pedagogical experiment (carrying out the stating experiment) visual screening of condition of a biogeometrical profile of bearing [7]; methods of mathematical statistics.

**Results:** it is established during the research, on the basis of visual screening that 74% of students had violations of bearing, and the largest number among them was made by students with scoliotic bearing. Tendencies and statistically reliable distinctions are established in values of assessment of condition of a biogeometrical profile of bearing of students in the direction of their reduction from course to course. The obtained data confirm the existence of the process of aggravation of symptoms of bearing of students.

**Conclusions:** the obtained data will be used at the scientific foundation and development of technology of correction of violations of bearing of students in the course of physical education taking into account the level of condition of their biogeometrical profile.

**Keywords:** students, physical education, biogeometrical profile of bearing.

## Introduction

Transformational processes which happen in the Ukrainian society except some positive shifts are reflected by the negative phenomena in activity of people – decrease in life expectancy, reduction of physical activity, increase of level of noninfectious chronic diseases, essential reduction of financial security, loss of reference points on healthy lifestyle, alienation of children, youth and adults from physical culture [5].

The present stage of reforming of the system of higher education is characterized by considerable intensity of the educational process. Many experts observe the decrease in volume of physical activity of students in Ukraine in recent years [8]. Such tendency is negatively reflected in physical development, physical preparedness and functional state of youth which causes the special social importance of preservation and promotion of health of student's youth [3].

Recently state of health of students becomes the subject of close attention of experts [1; 2; 9]. The numerous researches, which were conducted in recent years, demonstrate that functional violations of bearing are one of the most widespread deviations in skeletal and muscular system at modern students [7; 10].

The analysis of the published results of empirical researches and scientific publications demonstrates that, despite of the existence of the numerous scientific achievements, which are devoted by scientific and practical question of development of technologies, approaches and techniques of prevention

and correction of violations of bearing of student's youth in the course of physical education, remain not solved questions concerning the definition and theoretical foundation of technology of correction of violations of bearing of students in the course of physical education taking into account state their bio-geometrical profile.

## Communication of the research with scientific programs, plans, subjects

The work is performed according to subject of the Built plan of the RW in the sphere of physical culture and sport for 2011–2015 of the Ministry of Ukraine of family, youth and sport, by the subject 3.7. «Improvements of biomechanical technologies in physical education and rehabilitation taking into account specific features of motility of a person» (number of the state registration is 0111U001734).

## Purpose of the research

To learn features of changes of condition of the bio-geometrical profile of bearing of students in the course of physical education.

### Research task:

1. To learn the main types of violations of bearing of students in the course of physical education.
2. To learn the level of condition of the bio-geometrical profile

of bearing of students in the course of physical education.

## Material and Methods of the research

401 students of the 1–4 courses who study on day form of study took part in the research.

Such methods of the research were used for the performance of the put tasks: analysis of scientifically methodical literature and documentary materials; pedagogical supervision; pedagogical experiment (carrying out the stated experiment); visual screening of condition of the bio-geometrical profile of bearing [7]; methods of mathematical statistics.

## Results of the research and their discussion

The analysis of data of special scientifically methodical literature and information sources demonstrates that the bearing is one of the main and objective characteristics of physical state and health of modern young people, especially representatives of student's youth as intensity of the educational process, development of social and economic and living conditions of activity and study of students influence the level of their motor activity, morphological condition of organism and physical working capacity that in conclusion cause condition of the bio-geometrical profile of bearing and manifestation of appropriate the level of somatic health.

In our opinion, this situation truly displays powerful need to exercise first of all constant control and definition of dynamics of changes not only morphological indicators and indicators of physical preparedness of students, but also indicators, their spatial organization bodies which define condition of their bio-geometrical profile of bearing.

All students according to data of their medical records and according to methodical documents of the department of physical education of Galitskyi academy belonged to the main group of physical education and regularly attended class after physical education according to the established schedule – 2 trainings for week (4 educational hours).

We stated violations of bearing of students on all courses of study which were confirmed and testified by the orthopedic surgeon during the analysis of bearing (pic. 1).

The obtained data demonstrate that normal bearing is observed only among 33,0% of students of the 1st course. The subsequent consideration of results of the analysis of bearing helped to establish the negative tendency to reduction of number of students with normal bearing from the 1st to the 4th course. So, it is revealed that on the 2nd course the number of students with normal bearing equals already 28,8%, on the 3-rd course – 21,6%, on the 4th course – only 19,8%.

The established negative tendency of aggravation of symptoms of bearing of students from the 1st to the 4th course is confirmed by changes among the number of students with such functional violations as rounded back and scoliotic bearing. It is defined that 11,3% – on the 1st course of students with functional violation of bearing rounded back, on the 2nd course – 13,9%, on the 3-rd course – already 16,5%.

The greatest alarm is caused by the growth of number of students with scoliotic bearing: there were 37,4% on the 1st

course of such students, on the 2nd course – the number increased to 40,7%, on the 3-rd course – to 49,5% and on the 4th course – exceeded half of number of students and made 53,1%.

The number of students with such functional violations as flat back and rounded - concave back, was almost equal and did not exceed on average 10%. So, the number of students with flat back made: the 1st course – 9,6%, the 2nd course – 8,3%, the 3rd course – 5,2%, the 4th course – 7,4%; with – rounded concave back: the 1st course – 8,7%, the 2nd course – 8,3%, the 3rd course – 7,2%, the 4th course – 7,4%.

The threatening number of students with normal bearing and the received negative tendency of increase of number of students with its different functional violations put sharp requirement of urgent informative definition of state of the bio-geometrical profile of bearing of students. We applied the method of visual screening by means of the advanced card of express control the bio-geometrical profile of bearing for the solution of this task [7]. This approach of definition of state of the bio-geometrical profile of bearing of students was approved in the conducted researches of M. V. Dudko [2].

The characteristic of total score of the bio-geometrical profile of bearing of the surveyed finally testified the deterioration in its state when comparing the values of students of 2–4 courses with data of students of the 1st course (pic. 2).

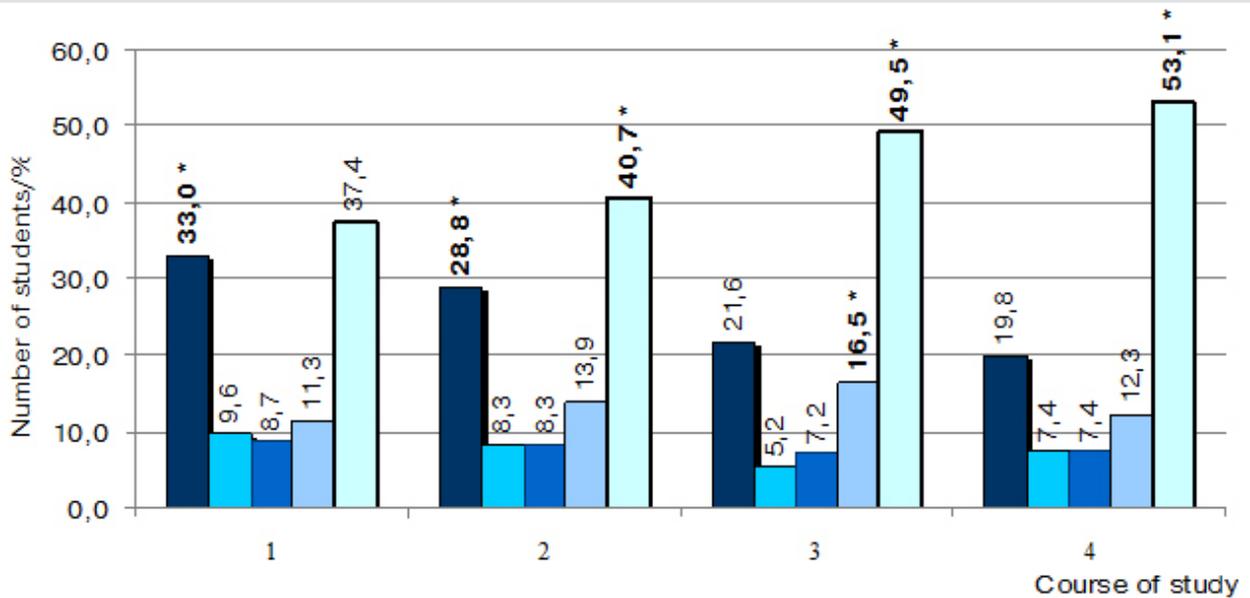
The reliable reduction of value of total score in comparison with value of total score of students of the 1st course ( $31,6 \pm 4,48$  points) was observed at students of 3 and 4 courses with normal bearing and high level of condition of the bio-geometrical profile of bearing ( $29,3 \pm 3,48$  and  $29,5 \pm 2,82$  points respectively).

Also the reliable difference towards reduction of number of points of total score of the bio-geometrical profile of bearing was noted also at the average level of its state: the total score equaled  $17,2 \pm 3,93$  and  $20,8 \pm 4,01$  points at students of the 4th and 3rd courses with normal bearing while at students of the 1st course average value of total score answered  $22,8 \pm 3,61$  points.

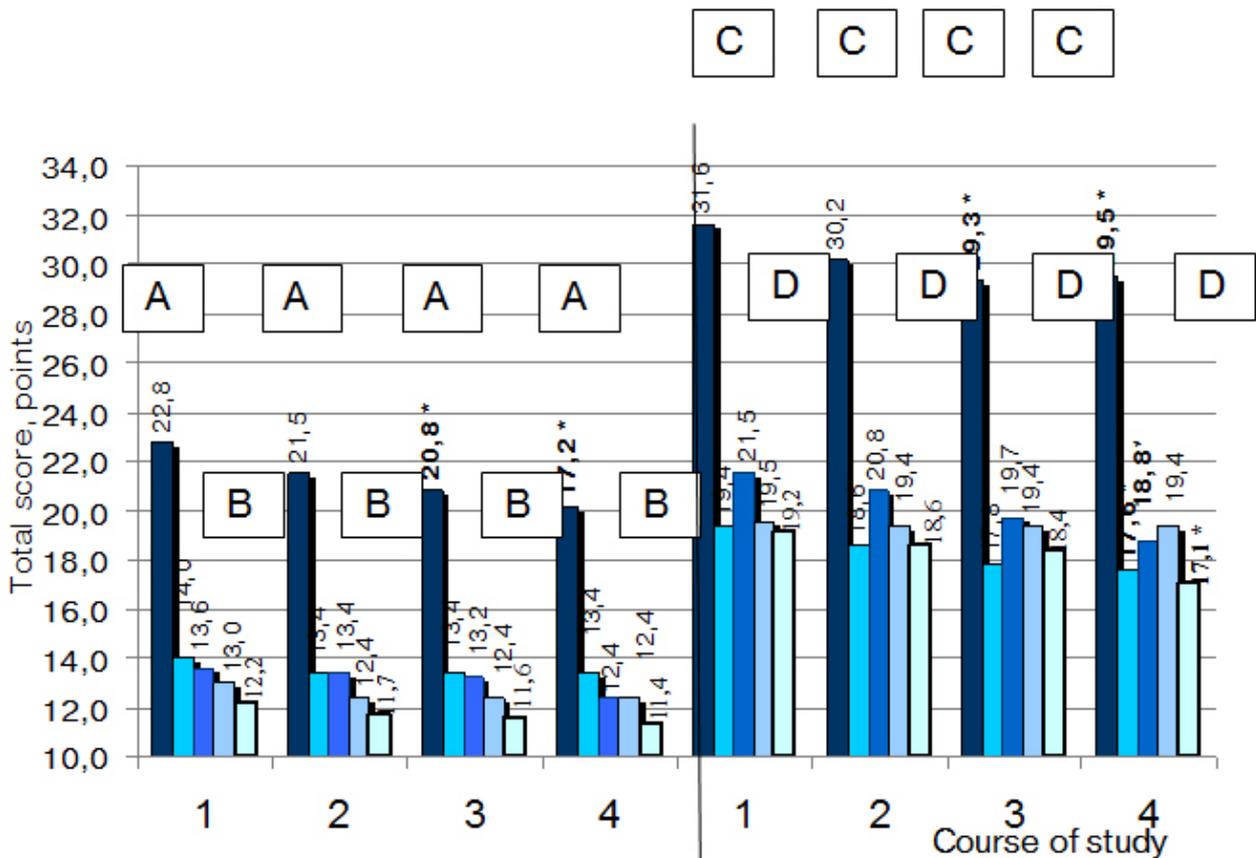
Values of total score of the bio-geometrical profile reduced automatically at students with the established functional violations of bearing as follows: flat back (students the 4th course –  $17,6 \pm 2,91$  points in comparison with students of the 1st course –  $19,4 \pm 3,38$  points); rounded-concave back (students the 4th course –  $18,8 \pm 3,46$  points in comparison with students of the 1st course –  $21,5 \pm 4,52$  points); scoliotic bearing (students the 4th course –  $17,1 \pm 3,07$  points in comparison with students of the 1st course –  $19,2 \pm 4,28$  points).

The established tendencies and reliable differences in values of assessment of the bio-geometrical profile of bearing of students towards their reduction from the course to the course testified the existence and continuous development of the process of deterioration in its state as a result of transition to the lowest level.

It should be noted that students with different types of violations of bearing who have the low level of state of the bio-geometrical profile get to so-called preclinical state OPA [2]. Considering this fact, it is expedient to note that the correction



**Pic. 1. Distribution of students of 1–4 courses according to the established functional violations of bearing:**  
 ■ – normal bearing; ■ – flat back; ■ – rounded-concave back; ■ – rounded back;  
 ■ – scoliotic bearing; \* – changes of sign are statistically reliable ( $p < 0,05$ ).



**Pic. 2. Total score of condition of the bio-geometrical profile of bearing of students 1–4 courses:**  
 ■ – normal bearing; ■ – flat back; ■ – rounded-concave back; ■ – rounded back;  
 ■ – scoliotic bearing; A – normal bearing (the average level of the bio-geometrical profile of bearing); B – flat back, rounded-concave, rounded back, scoliotic bearing (the low level of the bio-geometrical profile of bearing); C – normal bearing (the high level of the bio-geometrical profile of bearing); D – flat back, rounded-concave, rounded back, scoliotic bearing (the average level of the bio-geometrical profile of bearing); \* – changes of sign are statistically reliable ( $p < 0,05$ ).

of level of condition of their bio-geometrical profile of bearing has to be the prime task of work with such students.

## Conclusions

It is established during the experiment that 74% of students who took part in the research, had functional violations of bearing, and the largest number among them was made by students with scoliotic bearing. The fact could not remain unnoticed that the number of students with normal bearing decreased, and the number of functional violations in parallel increased at ratio of results of inspection of types of bearing of students of the 1st and the 4th courses of study.

Besides, we determined the accurate consistent pattern of decrease in the level of condition of the bio-geometrical profile of bearing towards its deterioration at students of major courses (the 3rd and the 4th course) in comparison with data of junior students (the 2nd and especially the 1st course).

## Prospects of the subsequent researches in this direction.

The development of technology of correction of violations of bearing of students in the course of physical education taking into account the level of condition of their bio-geometrical profile is provided on the basis of the obtained data.

**Conflict of interests.** The author declares that there is no conflict of interests.

**Financing sources.** This article didn't get the financial support from the state, public or commercial organization.

## References

1. Aloshina, A. I. 2015, *Profilaktika i korektsiya porushen oporno-rukhovogo aparatu u doshkilnyat, shkolyariv ta studentskoi molodi u protsesi fizichnogo vikhovannya* [Prevention and correction of the musculoskeletal system in preschoolers, schoolchildren and students in physical education], Lviv: Feniks, 365 p. (in Ukr.)
2. Dudko, M. V. 2016, *Profilaktika porushen biogeometrichnogo profilyu postavi studentiv u protsesi fizichnogo vikhovannya* : avtoref. kand. nauk z fiz. vikhovannya i sportu [Prevention of bioheometrychnoho Profile posture of students in physical education : PhD thesis], Kyiv, 20 p. (in Ukr.)
3. Kashuba, V. A. 2003, *Biomekhanika osanki* [Biomechanics of posture], K., 248 p. (in Russ.)
4. Kashuba, V. A., Futorny, S. M. & Dudko, M. V. 2015, [To the question of the use of innovative technologies of forming of healthy way of life of students in the process of physical education], *Naukoviy chasopis Nats. ped. un-tu im. M. p. Dragomanova* [A scientific magazine of M. p. Dragomanova National of pedagogical universitetet], Kyiv, Vip. 8(63), pp. 28–32. (in Russ.)
5. Kolos, M. A., Malinskiy, I. Y. & Yaremenko, V. V. 2015, [Typical features of carriage of students of junior and senior courses of the National university of government tax service of Ukraine], *Naukoviy chasopis Nats. ped. un-tu im. M. p. Dragomanova* [A scientific magazine of M. p. Dragomanova National of pedagogical universitetet], Kyiv, T. 1, Vip. 7(33), pp. 363–368. (in Ukr.)
6. Martynyuk, O. A. 2011, *Korektsiya narusheniy prostranstvennoy organizatsii tela studentok v protsesse fizicheskogo vospitaniya* : avtoref. dis. na soiskaniye uchen. stepeni kand. nauk po fiz. vospitaniyu i sportu [Correction of violations of spatial organization of body of students in the process of physical education], Kyiv, 20 p. (in Russ.)
7. Nosova, N. L. & Dudko, M. V. 2015, [Estimation of the state of carriage of students in the process of physical education on the basis of visual skrine], *Sportivna nauka Ukraini* [Sport science of Ukraine], Lviv, pp. 30–35. (in Russ.)
8. Ponyrko, Ye. A. 2013, *Korektsiya osanki u studentok vuzov sredstvami ozdorovitelykh vidov gimnastiki* : avtoref. kand. ped. nauk [Correction of carriage for the students of institutes of higher facilities of health types of gymnastics : PhD thesis], SPb, 22 p. (in Russ.)
9. Retivykh, Yu. I. 2009, *Metodika korektsii narusheniy osanki studentov sredstvami ozdorovitelnoy fizicheskoy kultury na osnove ucheta vidov i stepeni deformatsiy pozvonochnika* : avtoref. kand. ped. nauk [Method of correction of violations of carriage of students by facilities of health physical culture on the basis of account of kinds and degree of deformations of spine: PhD thesis], Volgograd, 23 p. (in Russ.)
10. Rudnitskiy, O. V. 2016, *Korektsiya tilobudovi studentok zasobami ozdorovchogo fitnesu* : avtoref. kand. nauk z fiz. vikhovannya i sportu [Correction of bodybuilding students by facilities of health fitness : PhD thesis], Kyiv, 24 p. (in Ukr.)

Received: 10.05.2016.

Published: 30.06.2016.

**Sergey Lopacki:** *Ivano-Frankivsk national medical University: Galician str, 2, Ivano-Frankivsk, 76018, Ukraine.*

**ORCID.ORG/0000-0001-7380-1739**

**E-mail:** [slopatskyi@gmail.com](mailto:slopatskyi@gmail.com)