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MODERN CORRECTION TECHNOLOGIES OF STUDENTS BODY CONSTITUTION BY HEALTH-ENHANCING FITNESS MEANS

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Abstract. *The article is devoted to development and justification of correction technology of female students' body constitution in the process of physical education. It is considered that the type of body constitution is genetic and unchangeable. At the same time body constitution isn't in advance a rigidly determined form, in the development it is subjected by endo and exogenous factors of variability. Scientific justification of the correction technology of female students' body constitution in the process of physical education by means of health-related fitness promoted allocation of its main components: technological basis united the purpose, objectives, and principles of its practical implementation in the process of students' physical education. The practical implementation of the technology involves three stages: preparatory, corrective, and supportive. Methodological basis of the technology encompasses 15 sets of physical exercises with different focus considering body constitution types, which are united in 8 models of practical sessions.*
Keywords: *health-related fitness, physical education, female students, body constitution, correction.*

Introduction.

Nowadays the realities of the modern world are that scientific and technical progress more and more penetrates human life and leads to comfortable work and a sedentary mode of life filled with a huge flow of various sort of information. In the system of universal values the high level of health is the fundamental basis that makes for the possibility of full-scale implementation of the individual's potential abilities [2, 4].

In the scientific surveys of the last decade [1, 3, 9] it has been proved that the body constitution is one of the characteristics of physical development which gives the objective idea of the spatial organization of morphological components of a human body, proportions, constitutional body traits, it also has distinct sexual, age and individual features. The body constitution of a person from the system standpoint can be also considered as the interconnected and interdependent collection of the morphofunctional components of his body [2, 5].

Problems of preservation and strengthening of health, first and foremost of the most active and young part of the population of our country, have been in the center of attention of science and practice of physical culture and sport. The deviations of the components of a constitution of female students from optimum values has a negative impact both on their physical and mental status [6] and demonstrate that existence of excess body weight aggravates associated diseases: hypertensive and coronary heart diseases, atherosclerosis, diabetes mellitus. This problem is confirmed also by the fact that about a half of students has various functional disorders of the locomotor apparatus [1, 7].

Nowadays the most popular and effective ways of correction the body constitution are the means of health-related fitness, in particular, strength physical exercises [2].

Purpose of the research – argumentation and elaboration of correction technology at female students' constitution by means of health-related fitness in the process of physical training.

Research problems:

1. To study morphological traits of students

with various types of a constitution in the process of physical education.

2. To develop correction technology of students' constitution in the process of physical education and to estimate its effectiveness.

Methodology and research organization

To accomplish the objectives set in the survey the following methods of research have been used: analysis of scientific and methodical literature and informational sources; sociological methods of research (questionnaire); pedagogical observation (review of more than 500 physical education lessons in higher education institutions); pedagogical experiment (carrying out the ascertaining and educational experiment); pedagogical testing (determination of general endurance level, physical workability, static and dynamic power endurance, flexibility level); video filming and the biomechanical analysis of a biogeometrical type of a man's back posture (measurement of the indicators of a sagital and frontal type of a posture with the use of the "Torso" program); methods of mathematical statistics.

The first and second-year 214 female students of KSEU of Vadim Getman, according to medical records data, took part in the research, the surveyed referred to the main medical group.

Research results and their discussion

According to the results of the research it has been established that 15% of the 1st-year students have ectomorphy type, 20% – endomorphy and 65% – normosthenic type. A similar ratio of constitution types has been defined among the second-year female students, namely: ectomorphy – 15%, endomorphy – 28% and normosthenic type – 57%. Study of the morphological features of female students with various constitution type included measurement of length, weight and girth body sizes (Figure 1).

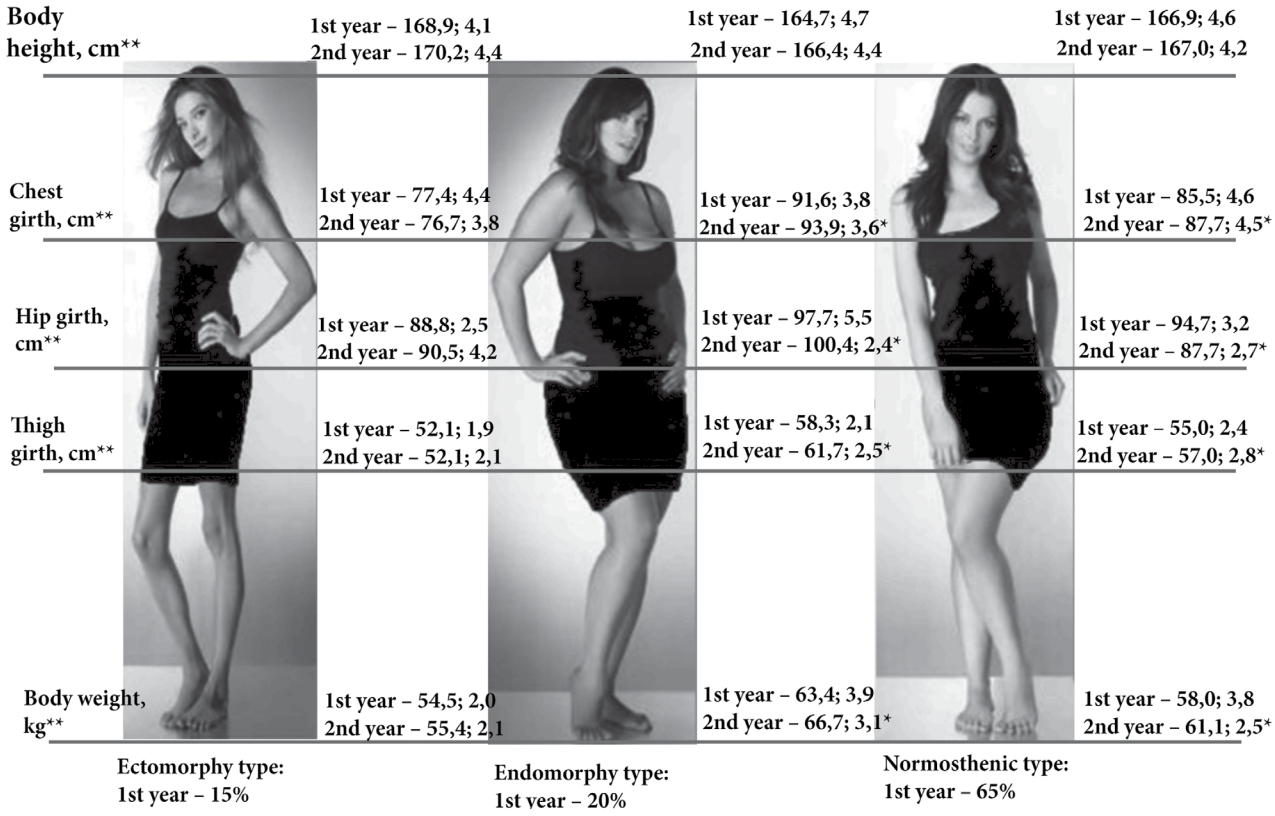

Fig. 1. Body constitution distribution of the 1st and 2nd-year female students and their morphological features: * – attribute variability is statistically significant ($p<0,05$)

Comparative analysis of these anthropometric researches allowed revealing a tendency to increase the average values of morphological indicators of the 1st and 2nd-year students irrespective of their constitution type. It is established the reliable increase of average values of body weight indicators, girth sizes of chest, hip and thigh among students with endomorthy type and normosthenic constitution type ($p<0,05$). When comparing of the obtained data with the norm indicators it is necessary to notice that the chest and hip girth of the students with endomorthy constitution type exceed them on the average by 12-17%, and the chest and thigh girth sizes of students with ectomorthy type are 16-21% lower.

Basic provisions of technology are formulated according to fundamental bases of the theory and technique of physical education [6], recommendations [2] on the improvement of educational process of physical education of students of higher educational institutions, huge scientific property in the direction of development and implementation of the correcting actions with young students with various disorders of the spatial body organization [8], scientific data on the research of a morphofunctional state of female students and application of means of health-related fitness in the process of the organization of physical education lessons for students [5, 9], and also taking into account the given ascertaining experiment and certain moderate direct and inverse correlation interrelations between somatometrical indicators and body goniometry indicators and female students' physical fitness (Figure 2).

Special objects of the developed technology were:

– formation and strengthening of female students' health of a higher educational institution while increasing efficiency of the process of physical education towards the correction of constitution taking into account the somatometrical indicators and body goniometry;

– increase of the level of development of physical qualities of students owing to the use of modern means of health-related fitness in the process of physical education;

– formation and preserving of a steady need for regular physical exercises;

– acquisition of theoretical knowledge by the students of higher educational institutions, practical skills and experience of application of health and fitness activity towards constitution correction.

The structure of technology was also constituted by three stages of practical realization, each of which solved the corresponding problems:

– preparatory – definition of a constitution type, indicators of goniometry and physical fitness of students; comparison with proper regulations; informing students about results of the conducted research; adaptation of their organism to physical activities; working out of sets of physical exercises;

– corrective – correction of a body constitution; improvement of a morphological state; increase of level of physical fitness of female students;

– supportive – examination of changes of the morphological condition of students and level of manifestation of their physical qualities; support by female students of the reached level of a morphological state and a OPA state, as well as physical fitness.

The data and a certain orientation of stages of practical realization of the technology itself, obtained during the ascertaining experiment, have allowed us to elaborate fifteen sets of physical exercises, which according to recommendations of experts [1, 5, 7], concerning development of the general structure of trainings, on the basis of the "block and modular" principle of their construction have been united in the corresponding modules.

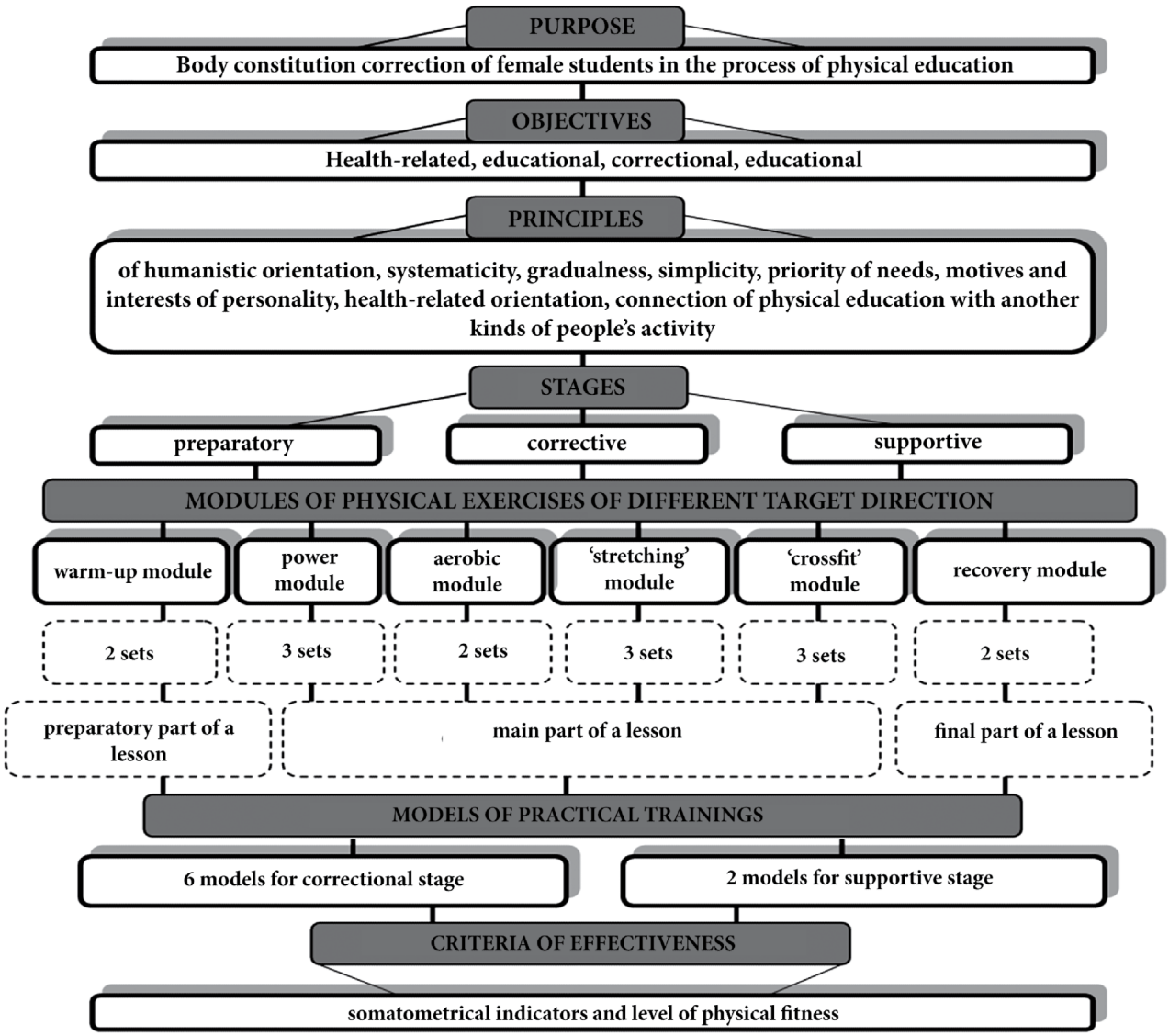

Fig. 2. Structure of correction technology of female students' constitution in the process of physical training

For preparatory part of occupation we have elaborated two sets of physical exercises which have constituted the "warm-up" module. For final part of training we have offered two sets of recovery exercises which have been integrated in the recovery module. Respiration exercises and static exercises in which the special attention is paid to the correct statement and preservation of vertical body position have entered in the contents of certain sets. These exercises had to solve problems of the correctional and supportive stages towards strengthening of static force of various muscular groups and improvement of the students' spatial body organization.

In order to resolve the problems of correction of students' constitution, decreasing or increasing of their body weight and the girth sizes, strengthening of structure and improvement of function of muscular and skeletal systems for the main part of practical trainings was offered eleven sets of physical exercises, and according to their orientation, were included in aerobic module, the power module, the stretching module and the module "krossfit". At present time the system "krossfit" is classified as one of the directions of modern health-related fitness, which unites

power and aerobic exercises, a plyometrics and other types of physical activity [8]. The organization of trainings including agents of "krossfit" system in accordance with the recommendations of experts [2, 6, 9] correspond to the following principles: inclusion of multidirectional physical exercises into sets; the use of a circular method; time control for exercises and the use of a competitive method; the use in various conditions of the trainings (work with apparatus and without, at the expense of a body weight; in the open air and indoors).

Conclusions

1. Undoubtedly today lifestyle is playing the leading role in the health of young students – the behavioral factor, depending on knowledge and ability to regulate one's own disposition, which determines the attitude towards own health and the world. An important condition of successful implementation of students' physical training is the science-based differentiation that assumes division of those who are engaged into typological groups by certain features, taking into account the purpose and objectives of educational process. It is established that among the 1st-year students there are 15% of girls who have ectomorphy type, 20% – endomorphy type, 65% – normosthenic constitution type. It is reasonable to note that among the 2nd-year students there are 57% surveyed who have normosthenic, 28% – endomorphy and 16% – ectomorphy constitution.

2. As the analysis of experimental data has shown, the 2nd-year students of endomorphy type on average have the largest body weight ($\overline{X}$;S) 63,4; 3,9 kg, and the smallest – students with ectomorphy constitution type 54,5; 2,0 kg. The body weight of female students with normosthenic constitution type averages to 58,0; 3,8 kg. The largest body weight was also established among the 2nd-year students with endomorphy type 65,7; 3,1kg, and the smallest – among girls with ectomorphy constitution type 55,4; 2,1kg. According to the obtained data, the 1st-year students who have ectomorphy constitution type are characterized by the greatest values of body length – on average 168,9; 1,1cm; and the smallest values – endomorphy type – 165,7; 4,7cm. The body length of the students with normosthenic constitution type averages to 166,9; 4,6cm. The greatest body length of the 2nd-year female students also corresponds to ectomorphy type 170,2; 1,4 cm, the smallest – endomorphy constitution 166,4; 4,4cm, and the body length of students with normosthenic type averages to 167,0; 4,2cm

It is notable that average values of a body weight indicator of the 2nd-year students were statistically-valid ($p<0,05$) more than data of the 1st-year students, irrespective of their constitution type whereas when comparing the body length, reliable differences between values of this indicator of the 1st and 2nd-year students with various type of a constitution weren't established ($p>0,05$).

3. Study of the most changeable and the discriminative signs of human constitution – the girth body sizes – has shown that the chest girth of the 2nd year students is ($\overline{X}$;S) 93,9; 4,6cm, hip girth 100,4; 2,4cm and thigh girth is 59,7; 2,5cm with endomorphy type and the chest girth is 87,7; 4,5cm, hip girth 95,9; 2,7cm and thigh girth 56,0; 2,8 cm with normosthenic type were authentically more, than among the 1st year students: endomorphy type – chest 91,6; 3,8cm, hip 97,7; 5,5cm, thighs 58,3; 2,3cm; normosthenic type –chest 85,5; 4,6 cm, hip 94,6; 3,2cm, thighs 55,0; 2,4cm ($p<0,05$). At the same time statistically significant distinctions in average values of the biolinks girth of the 1st and 2nd-year students with ectomorphy constitution type haven't been revealed ($p>0,05$).

4. Scientific reasoning of technology of correction of students' constitution in the process of

physical training by means of health-related fitness promoted allocation of its main components:

– technological reasons have united in itself the aim, objectives, and also the principles of its practical implementation in the process of female students' physical training;

– practical implementation is provided by three stages: preparatory, corrective and supportive, each of which solved the corresponding problems;

– methodical bases of technology included 15 sets of physical exercises of various target orientation taking into account constitution types which are united in 8 models of practical trainings and are offered for approbation in the program of physical education of the 2nd year students of Kiev National Economic University of Vadim Getman;

– criteria of efficiency include the detailed analysis of the somatometric indicators, indicators of a body goniometry and students' physical fitness.

The carried out educational experiment has confirmed the efficiency of technology of correction of students' constitution by means of health-related fitness that gives all grounds to recommend it for the use in the process of physical training in higher educational institutions.

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