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USE OF CORRECTIONAL TECHNOLOGIES IN THE PROCESS OF HEALTH-RECREATIONAL FITNESS TRAINING BY MEN WITH IMPAIRED BIOGEOMETRIC PROFILE OF POSTURE

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Abstract

The purpose of the article is to study the effectiveness of correctional technology applied for impairment of biogeometric profile of posture observed among mature men in the process of their health-recreational fitness training. **Objective.** In general, the number of respondents involved in the sequential transformation phase of the experiment comprised of $n = 50$ people, i. e. men in the second period of their adulthood (35 – 45 years). **Methods.** The paper uses the data gained from the analysis of professional scientific and methodological literature, pedagogical observation; functional assessment of movements; analysis of men's posture was performed using the "Torso" program, visual screening of the biogeometric profile of posture, methods of mathematical statistics.

Results of the study. The paper presents a theoretical generalization as well as it offers a new solution to the scientific task, which presupposes development and scientific substantiation of correctional technology, applied for impairment of biogeometric profile of posture observed among men of the second period of their

adulthood in the process of their health-recreational fitness training, all together aiming at improving general health. The author's technology consisted of three stages, in which physical activity was strictly regulated. The letter was determined on the basis of diagnosing the state of men's posture biogeometric profile. Among the criteria for the effectiveness of the author's technology the following ones should be noted, including the type of posture, the level of biogeometric profile of posture, the level of movements functional assessment, indicators of physical development, as well as physical fitness level of men aged 36 – 45 years. **Conclusions.** The results of a consistent transformation experiment have confirmed the effectiveness of the developed technology when it is used for correction of impaired biogeometric profile of the posture observed among men in the second period of their adulthood during their fitness training process. During the study the effectiveness of the author's technology was experimentally confirmed, which in its turn served as a basis for recommending it for practical use in the process of health-recreational fitness training by mature men. The framework of this work does not reduce the scientific potential of the chosen issue, and therefore the prospect of further research is to introduce and study the effectiveness of a differentiated approach to health-recreational fitness training by mature women given the level of biogeometric profile of their posture.

Key words: health-recreational fitness, technology, condition of biogeometric profile posture, correction, men, mature age.

Problem formulation. At the present stage of Ukrainian society development, theorists and practitioners of physical education and sports emphasize the undoubted urgency of an issue of a significant deterioration in physical condition and health among adults due to their physiological changes caused by natural aging process [4, 6, 9, 25]. It is generally accepted in the scientific community [1, 3, 8, 24] that the determinants of reduced functional capacity and increased risk of cardiovascular disease among adults, including men, are namely the accumulation of excess body weight or reduced physical activity combined with other negative factors and habits. The urgency of the above mentioned problem is enhanced by the importance of saving life and health of mature adults as the category of the population with the greatest work

and life experience, which is of particular value to society in general [7, 17, 18, 20, 26].

The issue of health measurement concerning regular physical exercises by adults has been the subject of a number of theoretical and experimental studies [10, 14, 19].

It is known [2, 21, 22] that the factor of reducing the body functional potential and the emergence of a number of chronic diseases is the age imbalance of the musculoskeletal system, which manifests in the state of biogeometric profile of posture.

Analysis of recent research and publications. By systematizing and generalizing the professional literature on the issue stated in our dissertation, we realised the possibility to form a scientific vision of the level of biogeometric posture profile in line with paradigmatic approaches to assessing the spatial organization of the human body [11, 13, 15, 16]. Scientific knowledge of human posture biomechanics [18, 19], which is represented by a wide range of research on the diagnosis as well as prevention and correction of the latter, based on the use of effective physical exercises [1, 5], requires implementation of currently topical technology aimed at correction of impaired biogeometric posture profile of men in their second mature age during their health-recreational fitness training [6, 12].

The topic of the article is developed in accordance with topic 3.13 “Theoretical and Methodological Bases of Health-forming Technologies in the Process of Physical Education among Different Population Groups” (state registration number 0116U001615).

Objective. In general, the number of respondents involved in the sequential transformation phase of the experiment comprised of $n = 50$ people, i. e. men in the second period of their adulthood (35 – 45 years).

Methods and organization of the study. In accordance with the topic of the research, we have analysed and summarized the scientific and

methodological papers by Ukrainian and foreign experts. The analysis of scientific and methodical literature was carried out to form a theoretical basis, define modern tendencies in research regarding correction applied for impairment of biogeometric profile of posture observed among mature men in the process of their health-recreational fitness training. Empirical level of research included pedagogical observation; functional assessment of movements “Functional Movement Screen, FMS” (G. Cook, L. Burton); photography and analysis of men's posture was conducted with the help of “Torso” program (V. O. Kashuba, 2003); visual screening of the state of biogeometric posture profile was carried out with the help of express control map (V. O. Kashuba, R.V. Bibik, N.L. Nosova, 2012). The experimental data accumulated during the study were processed by using traditional methods of mathematical statistics, which allow to operate with such statistical indicators as arithmetic mean (\bar{x}), standard deviation (S), arithmetic mean error (m). Verification of the samples presented in dissertation for compliance of the latter with the normal distribution law was ensured by the use of generally accepted methods of calculating the indicators of asymmetry and excess. Establishing the statistical significance of the obtained research results required the use of Student's t-test in the projection of the sample data dependence or independence. In the context of the criteria selected in the study we should indicate the reliability $P = 0.95$, significance levels $\alpha = 0.05$, sometimes - $\alpha = 0.01$ ($p < 0.05$ and $p < 0.01$, which means the probability of error is not higher by 5 or 1%). Tracking the dynamics of the results for functional assessment of movement by men in the second period of their adulthood (in view of their level of biogeometric posture profile) was facilitated by one-way variance analysis, the advantages of which were seen in the ability to determine the sufficiency of sample indicators, the relationship of performance and factor characteristics to be presented as the sample data in general scope; assessment of the influence of the biogeometric posture profile level of the examined men on the indicators of their physical fitness. In addition

to one-way variance analysis, the study also addressed to two-way variance analysis, in particular to determine the dependence of the physical qualities development both on the level of biogeometric posture profile and posture type of men during the second period of their adulthood. The prospects of the latter method have outlined the possibility of obtaining reliable conclusions concerning samples of small quantity [23]. The processing of the data obtained during the study was provided by the use of the MSExcel table editor and the Statistika7.0 software. Based on the results of the ascertainment experiment, the author's technology has been developed, which is based on the principles of systematization, unity of theory and practice, determinism, health orientation, as well as humanistic, axiological, personality-oriented, activity and technological approaches; it consists of three stages, structural components (conceptual, organizational and diagnostic), involves the use of isotonic rings, rolls, mini-balls, fit-balls, special equipment (e.g. "Reformer") and evaluation of corrective and preventive measures effectiveness according to selected criteria.

Results. By post-experimental analysis of posture type of men in the second period of their adulthood, an increase of 31.8% among men aged 36-40 years was determined in the share of persons with normal posture and, accordingly, 17.9% among the men aged 41-45 years in the share of persons with normal posture.

The effectiveness of the technology suggested in the dissertation is proven by the results of assessing biogeometric posture profile level of the men in their second mature age, namely, increase among men ages 36-40 up to 9.1%, as well as a decrease in proportion of people with a round back and medium and low levels of biogeometric posture profile by 4.5% and 18.2%, respectively; an increase in the share of men with normal posture and a high level of biogeometric posture profile among men aged 41–45 by 17.9%.

The comparison of the results, obtained during the experiment, with the results of the previous study a post-experimental statistically significant ($p < 0.05$)

increase in the biogeometric posture profile of men aged 36-40 years was found out in the sagittal and frontal planes, as well as general assessment of their biogeometric posture profile, and also tendencies to post-experimental statistically significant ($p < 0.05$) improvement of separate indicators was revealed as well as the general estimation of biogeometric posture profile for men aged 41–45 (see Table 1).

Table 1

Analysis of indicators for biogeometric posture profile state among men aged 36 - 45 years after the experiment (n = 50)

Indices		Average statistical indicators of biogeometric posture profile state, score					
		Sagittal plane	Δ , %	Frontal plane	Δ , %	Biogeometric posture profile state	Δ , %
36 – 40	\bar{x}	11,36	28,21	10,59	8,88	21,95	18,09
	s	2,85		2,59		5,26	
	m	0,61		0,55		1,21	
41 – 45	\bar{x}	10,29	33,33	9,86	11,29	20,14	21,55
	s	2,32		2,53		4,75	
	m	0,404,04		0,520,48		0,910,9	

Obviously, the posture of men in the second period of their adulthood has been positively influenced by trainings according to the suggested technology, which can explain the above-mentioned changes.

As a result of introduction of the author's technology in the process of health-recreational fitness training the men in the second period of their adulthood have shown improvement in the functional assessment of their movement, in particular a statically significant ($p < 0.05$) improvement in the functional assessment of 36-40-year-old men in all (seven) test exercises; moreover, statically significant ($p < 0.05$) improvement of functional assessment

of movements for men aged 41 - 45 years in all (seven) test exercises, except for the test exercise aimed at determining the mobility of shoulder girdle, where in the absence of statistically significant ($p > 0.05$) changes positive dynamics was observed.

It was stated that the use of technology for correction of impaired biogeometric posture profile of men aged 36-45 years in the process of their fitness training has contributed to increased physical fitness of men in the second adult age, namely, statistically significant ($p < 0.05$) increase in endurance of abdominal muscles for both subgroups (for men aged 36–40 this increase was 7.85%, and for men aged 41–45 years – 7.83%), as well as statistically significant ($p < 0.05$) positive changes in the mobility of the hip joint and lumbar region of spine among men involved in the experiment.

Conclusions. The paper presents a theoretical generalization and suggests a new solution to the scientific issue, related to development and scientific substantiation of the technology aimed at correction of impaired biogeometric posture profile for men in the second period of their adulthood in the process of health-recreational fitness training, in order to improve their health. The author's technology consisted of three stages, in which physical activity was strictly regulated, which was determined on the basis of diagnosing the state of men's biogeometric posture profile. Among the criteria for the effectiveness of the author's technology the following criteria should be noted: the type of posture, the level of biogeometric posture profile, the level of functional assessment of movements, indicators of physical development, as well as physical fitness of men aged 36 – 45. The results of a consistent transformation experiment have confirmed the effectiveness of the developed technology for the correction of disorders of biogeometric posture profile for men in the second period of their adulthood in the process of their health-recreational fitness training. Prospects for further research are related to determining the delayed effect of the author's technology.

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