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Original Scientific Article

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Characteristics of the level of the biogeometric profile of posture in women aged 41-45 with risk factors for cardiovascular diseases

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Abstract

Purpose. To assess the impact of the corrective and preventive program on the biogeometric profile of women aged 41-45 for the further development of the concept of physical culture and sports rehabilitation for women in the second period of mature age at risk of developing cardiovascular diseases.

Material & Methods. The study was conducted at the Profizio Medical Center in Kharkiv, which organizes a "Women's Health School."Women aged 41-45 were divided into groups at their own request: OG (n=15) and CG (n=16). The programs differed in their psychocorrection methods, and the women in the CG did not perform myofascial release using a massage roller.

Results. Before the experiment, the stoop index values in the main group ranged from 65% to 80%, meaning that none of the participants had a normal posture. The dynamics of changes showed an increase in the stoop index in almost all participants, indicating an improvement in the position of the shoulder girdle and a decrease in the severity of deformation. In women in the control group before the experiment, the stoop index ranged from 72% to 86%. After completing the program, these ranges remained unchanged; none of the participants achieved improvement or transition to another category. The dynamics of the cervical spine curvature depth index in groups of women aged 41-45 before and after the experiment also indicate changes only in the main group. After completing the program, all participants in the main group showed an increase in the depth of the cervical curve, which ranged from 4.1 to 4.7 cm, i.e., the values were noticeably closer to normal. No changes were recorded in the women in the control group.

Conclusions. After completing the program, all participants in the main group showed a reduction in stooped posture and an improvement in cervical curvature to normal values. It strengthens the muscles of the cervical and thoracic spine, improves muscle tone and elasticity, and reduces functional limitations.Classes based on the author's corrective and preventive program contributed to the normalization of the functional state of the cervical spine and the restoration of its natural shape in all participants of the main group aged 41-45 years. No changes in dynamics were observed in women in the control group, which emphasizes the advisability of using targeted rehabilitation measures to optimize posture.

Keywords: women, second period of mature age, cardiovascular risk, biogeometric posture profile.

Introduction

Common features of the second period of adulthood are the onset of age-related changes in the musculoskeletal system, decreased ligament elasticity, reduced strength and endurance of the back and abdominal muscles. Age-related changes in the intervertebral discs occur, affecting posture. Due to physical inactivity, excess weight, and emotional stress, women often develop compensatory deviations (Lorbergs, 2017; Lazko, 2021; Asauliuk, 2023; Kozlovska, 2023; Kashuba, 2025).

The biogeometric profile of the posture of women in the second period of middle age is characterized by age-related increase in thoracic kyphosis, asymmetries of the trunk and shoulder girdle, decreased muscle tone, possible scoliosis changes, and functional disorders of the spinal stabilization system. It has been proven that the biogeometric profile of posture in this category of women has a direct and indirect impact on the development of cardiovascular diseases (Silva, 2023; Kashuba & Ruban, 2025; Fedynak & Vypasyak, 2025). Incorrect posture restricts respiratory and circulatory function, causes congestion, and increases the risk of arterial hypertension. Posture is a factor that modulates the development of cardiovascular diseases through respiratory, hemodynamic, vegetative, and motor links. We consider the condition of the musculoskeletal system to be one of the indicators of women's overall physical health, on which their physical activity and mobility depend. Changes in posture, disturbances in the physiological curves of the spine, and the development of deformities not only reduce motor function but can also lead to pain, discomfort, circulatory disorders, and a decline in overall health (Carini, 2017; Harvey, 2020; Ruban, 2021; Samoiluk, 2025; Grygus, 2025). It is particularly important to study these parameters in women in the second period of middle age, as it is during this period that age-related changes in the musculoskeletal system often occur, associated with a decrease in physical activity, the influence of hormonal changes, and the development of degenerative-dystrophic processes. The significance of the biogeometric profile of posture is shown in Fig. 1.

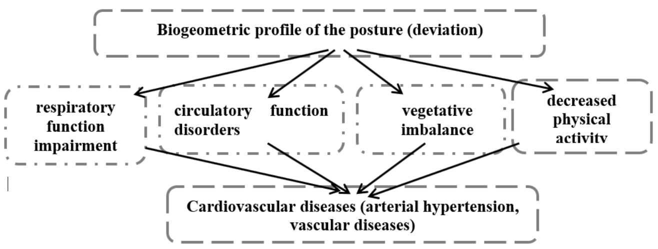

Figure 1. Diagram of the influence of the biogeometric profile of posture on the risk of developing cardiovascular diseases

The results of our preliminary study showed that in the second period of adulthood, the biogeometric profile of posture is characterized by a certain tendency toward stooping, which is more pronounced in women aged 41–45 than in women aged 36–40. The depth of the cervical spine curvature was also less in women in the older group, indicating an increase in physiological posture disorders, as well as fluctuations in cardiovascular system parameters (Kashuba & Ruban, 2025).

There is a lack of research in scientific literature on the development and implementation of corrective and preventive programs for restoring the biogeometric profile of posture and the functional state of the cardiovascular system in women in the second period of mature age.

The ***purpose of the study*** – to assess the impact of the corrective and preventive program on the biogeometric profile of women aged 41-45 for the further development of the concept of physical culture and sports rehabilitation for women in the second period of mature age at risk of developing cardiovascular diseases.

Material and Methods

Participants

The study was conducted at the Profizio Medical Center in Kharkiv, which organizes a "Women's Health School." A total of 47 women aged 36-45 participated in the study. The selection criterion was the presence of modified risk factors for cardiovascular disease. All respondents were informed about the scientific study and provided written consent to participate in the study. The confidentiality of information about the participants was ensured by explaining that all data would be anonymous and used for research purposes.

Ethics Statements

The study was conducted in compliance with all relevant national regulations and institutional policies, the principles of the Declaration of Helsinki adopted by the General Assembly of the World Medical Association (1964-2000), and the Council of Europe Convention on Human Rights and Biomedicine (1997).

Study design

Posture was examined in the frontal and sagittal planes using the REEDCO posture scale. The REEDCO (Reedco Posture Scale) is one of the most well-known methods for qualitative and quantitative assessment of posture in the frontal and sagittal planes. The scale includes 10 criteria that are assessed in points: 5 criteria in the frontal plane (symmetry of the head, shoulders, shoulder blades, pelvis, knees) and 5 criteria in the sagittal plane (position of the head, thoracic

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PHYSICAL REHABILITATION AND RECREATIONAL HEALTH TECHNOLOGIES
Vol. 10 No. 5, 2025

kyphosis, lumbar lordosis, abdomen, legs/knees). Interpretation of results: 17-20 points – correct posture; 13–16 points – minor deviations; 9–12 points – significant deviations; less than 9 points – pronounced posture disorders.

The depth of the physiological cervical curve (cervical point) was measured using the method developed by Z.P. Kovalkova. With correct posture, the depth of the cervical curve of the spine is within the range of 5-5.5 cm.

The study was conducted in two stages. The first stage was a transformative pedagogical experiment involving women aged 36-40 (n=16), which lasted 3 months. The "Women's Health School" used an author's corrective and preventive program. The women performed therapeutic exercises aimed at stretching and strengthening the muscles of the trunk and limbs; exercises for the muscles that stabilize the spine; a set of McGill exercises; and flossing. Specialists from the Women's Health School held talks on the need to change their lifestyle, aimed at motivating and directing women towards physical activity in the context of preventing cardiovascular disease; they taught women how to perform breathing and relaxation exercises and myofascial release using a massage roller. Three times a week, under the supervision of a physical education and sports rehabilitation specialist, women engaged in training walks. A psychologist taught women exercises using the Shulz method. With the help of an online calorie calculator, women monitored the calorie content of their food. The use of the author's corrective and preventive program significantly improved the biogeometric profile indicators on the REEDCO posture scale and the change in the depth of the spine curvature according to the method of Z.P. Kovalkova ($p<0.05$) (Kashuba & Ruban, 2025).

Stage two: women aged 41-45 were divided into a main group (n=15) and a control group (n=16) at their own request. The main group (MG) followed the author's program, while the control group (CG) followed the Profizio program. The programs differed in their use of various methods of kinesiotherapy and psychocorrection, and the women in the control group did not perform myofascial release using a massage roller.

Statistical analysis

Statistical processing of the obtained results was performed using the statistical software package Statistica 13.0. Descriptive statistics were obtained, which included calculations of the arithmetic mean (M), standard deviation (s), standard error of the mean (m), median (Me), minimum (min) and maximum values (max), as well as quartiles of distributions (25%, 75%). To compare independent samples, the t-value of Student's criterion for paired samples was used; the level of reliability of changes (p) was determined by the following critical values: t_kr(15; 0.001)=4.07.

Results

Analysis of changes in the stoop index allowed us to record shifts in the posture of participants in the main group after the implementation of the corrective and preventive program (Fig. 2).

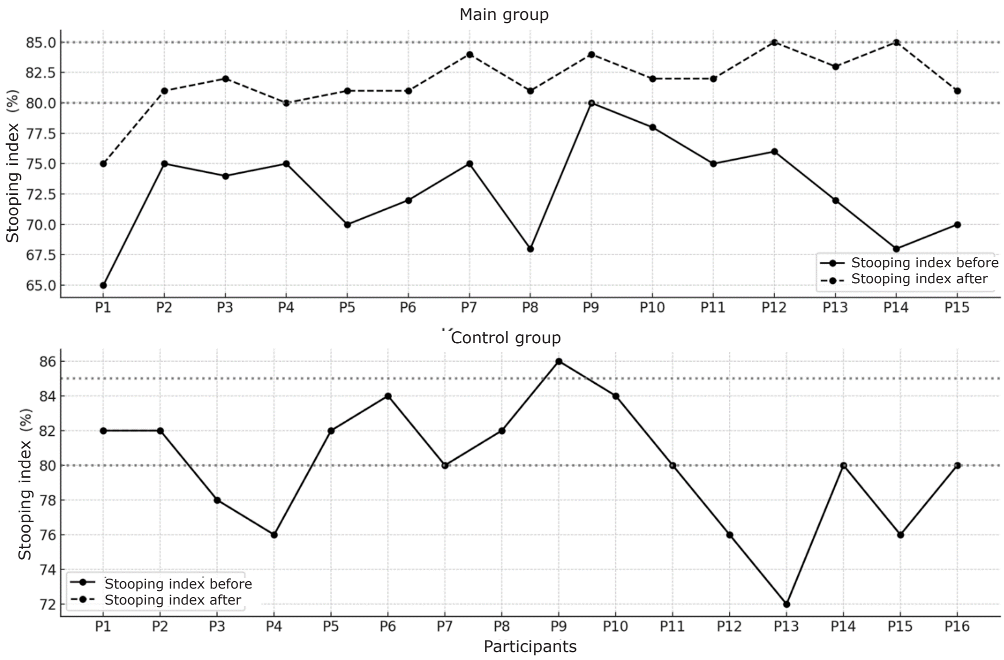

Figure 2. Individual stoop indices of women aged 41–45 from the main (n=15) and control (n=16) groups before and after the experiment, where the solid line represents before the experiment, the dotted line represents after the experiment, the horizontal lines indicate the upper limits of the posture assessment, and the marks Pn represent the code of the study participant.

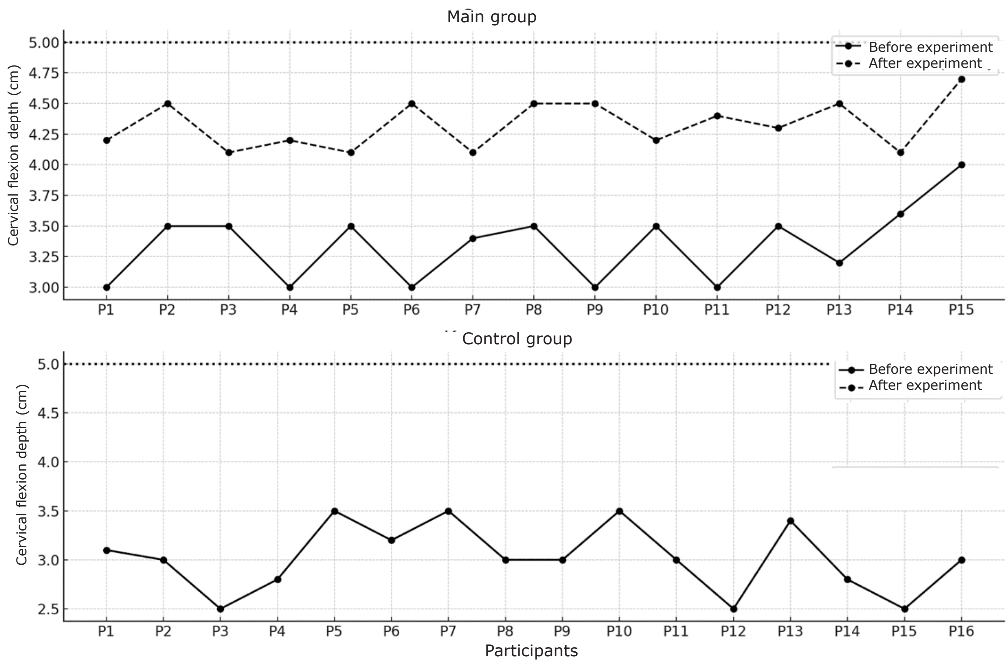

Figure 3. **Depth of the cervical spine curvature (in cm) in women aged 41-45 from the main (n=15) and control (n=16) groups before and after the experiment, where the solid line – before the experiment, dotted line – after the experiment, horizontal line indicates normal limits, marks Pn – code of the study participant.**

As can be seen from the graph, almost all participants in the main group showed an increase in the stoop index, indicating an improvement in the position of the shoulder girdle and a reduction in the severity of the deformity. Before the experiment, the stoop index ranged from 65% to 80%, meaning that none of the participants had normal posture. In 20% of women, the index was below 70% (severe stoop). Another 60% had values between 70% and 75%, and only 20% were in the range of 76% to 80%, which corresponded to the borderline condition. After the experiment, none of the participants had an index below 75%. All values increased and ranged from 75% to 85%, which, according to the classification, corresponds to a tendency to stoop. Thus, after the program was implemented, the index limits shifted by 6-15% towards the norm, and in 86.6% of women, the values reached the 81–85% range. Two more participants (13.4%) remained at 80%, i.e., at the upper limit of the borderline condition.

In the CG before the experiment, the stoop index values ranged from 72% to 86%. Half of the participants were in the 76–80% range, 37.5% were in the 81-85% range, another 6.25% were in the 70–75% range, and only one woman had a normal score above 85%.

After completing the program, these ranges remained unchanged; none of the participants achieved improvement or transitioned to another category. This fact is clearly visible in the graph, where the before and after lines almost completely coincide, demonstrating the consistency of results when using the traditional approach. Thus, we have a marked increase in stoop indices in women with MG and a shift towards a better posture category. At the same time, the absence of changes in the CG further justifies the use of a comprehensive author's program as an effective tool for correcting posture disorders in women aged 41-45. The indicators of the depth of the cervical spine curvature in groups of women aged 41-45 before and after the experiment also indicate changes only in the CG (Fig. 3).

No changes were recorded in the CG women. The values of the cervical curvature depth after the experiment remained unchanged – from 2.5 to 3.5 cm, which makes the traditional health program for correcting the cervical curvature depth insufficiently effective.

As we can see, classes based on the author's program contributed to a reduction in stooping, normalization of the functional state of the cervical spine, and restoration of its natural shape in all participants from the MG aged 41-45 years. No dynamics were observed in the CG, which emphasizes the advisability of using targeted rehabilitation measures to optimize posture.

Regarding the analysis of changes in quantitative indicators, it was appropriate to use the Wilcoxon criterion in the MG to assess their reliability, while in the CG all indicators were normally distributed, i.e., they needed to be compared using the t-criterion.

Having done this, we found that the changes in the MG were statistically significant (Table 1).

Before the experiment, the average stoop index in the main group was 72.87±4.09%, which

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Vol. 10 No. 5, 2025

Table 1. Dynamics of biogeometric profile indicators in women aged 41–45 from the main (n=15) and control (n=16) groups during the experiment

Testing time	Statistical indicators	Biogeometric posture profile indicators			
		Main group		Control group	
		Stoop index, %	Depth of spinal curvature in the cervical region, cm	Stoop index, %	Depth of spinal curvature in the cervical region, cm
Before the experiment	**M**	72,87	3,35	80	3,02
	s	4,09	0,30	3,65	0,34
	min	65	3	72	2,5
	max	80	4	86	3,5
	25%	70	3	76,5	2,8
	Me	74	3,5	80	3
	75%	75	3,5	82	3,35
After the experiment	**M**	81,80	4,33	80	3,02
	s	2,46	0,20	3,65	0,34
	min	75	4,1	72	2,5
	max	85	4,7	86	3,5
	25%	81	4,1	76,5	2,8
	Me	82	4,3	80	3
	75%	84	4,5	82	3,35
Reliability of changes	t	-	-	-	-
	Z	−3,414	−3,413	-	-
	p	p<0,01	p<0,01	-	-

corresponded to a pronounced stoop according to the classification scale. The median was 74%, and the minimum was 65%, which indicated the prevalence of posture disorders in this group. After the experiment, this indicator increased to 81.80±2.46% (by 8.93%), and the median value reached 82% (p<0.01). That is, a transition from a pathological state to a zone of susceptibility to stooping or even normality was recorded, indicating objective improvements in posture.

The depth of the cervical curve in women with MG also increased from 3.35±0.30 cm to 4.33±0.20 cm (an average of 0.98 cm or 29.28% of the initial level), which corresponded to a statistical significance level of p<0.01. At the beginning and end of the experiment, none of the participants had normal values (5-5.5 cm), but after completing the program, the indicators were significantly closer to normal. The increase in average, minimum, and maximum values, as well as the decrease in data dispersion, indicated a stable effect of posture correction in the participants.

In the control group, all indicators remained unchanged: the stoop index remained stable at 80±3.65%, and the depth of the cervical curve was 3.02±0.34 cm with no signs of dynamics, demonstrating the absence of a positive effect from the use of traditional health-improving techniques.

Thus, the author's corrective and preventive program provided statistically significant and clinically important improvements in the biogeometric profile of posture in women aged 41-45 who had musculoskeletal disorders. At the same time, the use of the traditional program in the control group proved ineffective in changing posture.

Discussion

A systematic analysis of the literature confirms the authors' (Kashuba V., Samoiliuk O. et. al. 2025) opinion that in recent years there has been increased interest among specialists in the diagnosis of a growing number of posture disorders, diseases of the musculoskeletal system, and the systematic and quantitative assessment of the degree of existing motor dysfunctions in humans.

In the course of the study, scientists confirmed (Alkhawajah et al., 2025) that the level of the biogeometric profile of women's posture has a significant impact on physical fitness. In particular, the authors observed better physical fitness in women with a high biogeometric posture profile compared to women with scoliosis and a low biogeometric profile.

The aim of the study (Wang H. Gao et. al. 2022) was to investigate which postures lead to chronic sympathetic activation and may affect the cardiovascular and autonomic nervous systems. In a pilot study, the authors demonstrated that regular and moderate physical activity improves the functioning of the cardiovascular and autonomic nervous systems, but few studies that have examined the effect of posture changes during movement on the functioning of the heart and autonomic nervous system.

Research (Fathima et al., 2024). expanded the knowledge about the relationship between heart rate variability and posture in people who lead a sedentary lifestyle. The results of the study showed that changes in posture led to vegetative adjustments in the parasympathetic and sympathetic nervous systems, as indicated by the difference in heart rate variability parameters. In other words, prolonged sitting can have negative consequences for cardiovascular health.

We agree with the authors (Quintero Santofimio et al., 2023), who concluded in their work that reducing sedentary behavior to less than 3 hours and promoting proper sitting posture (reducing forward leaning and sitting with a straight back) can improve autonomic function and should be a key focus of future ergonomic interventions.

The results of this study (Sureshbabu et al., 2025) are consistent with the theoretical understanding that posture can affect autonomic function. Poor posture, commonly referred to as "text neck," is associated with an imbalance in cardiac autonomic regulation, specifically an increase in sympathetic nervous system activity and a decrease in parasympathetic modulation, as measured by heart rate variability. The authors confirm the growing body of literature suggesting that poor posture alignment, especially of the head and neck, may contribute to autonomic imbalance. This study provides compelling evidence that when developing a program for middle-aged women with changes in their biogeometric profile, more attention should be paid to therapeutic exercises for the cervical spine.

Based on an analysis of the results of the work of scientists (Sepehri et al., 2024), it can be concluded that performing therapeutic exercises in the form of strength exercises, stretching, shoulder exercises, and incredibly complex exercises that affect all muscles can be effective in reducing forward head posture, "text neck," slouching shoulders, and thoracic kyphosis.

Conclusions

The overall level of the biogeometric profile of the posture in the women studied before the implementation of the corrective and preventive program showed significant changes. The difference between the programs for women in the main and control groups was the different methods of kinesiotherapy and psychocorrection, and the women in the control group did not perform myofascial release using a massage roller.

The dynamics of the stoop index in women in the experimental group indicated an improvement in the position of the shoulder girdle and a decrease in the severity of the deformity. In the control group, these limits remained unchanged after the completion of the program; none of the participants achieved improvement or transition to another category.

After completing the program, all participants in the MG showed an increase in the depth of the cervical curve, i.e., the values approached the norm. The strengthening of the muscles of the cervical and thoracic spine, improvement in muscle tone and elasticity, and reduction in functional limitations provided by the author's program made the tendency toward restoration of physiological curves evident, although the normal value (5-5.5 cm) was not achieved. Classes based on the author's program contributed to a reduction in stooped posture, normalization of the functional state of the cervical spine, and restoration of its natural shape in all participants with MG aged 41-45 years. No dynamics were observed in the CG, which emphasizes the advisability of using targeted rehabilitation measures to optimize posture.

Prospects for further scientific research are related to the analysis of the dynamics of cardiocirculatory parameters based on the results of the formative experiment.

References

Asauliuk, I., Nosova, N., Demokhin, D., Pokropyvnyi, O., & Marinchuk, P. (2023). The state of posture biomechanics as a criterion for differentiating classes in the process of sports rehabilitation. *Physical culture, sports and health of the nation,* 15(34), 406–420. 420. https://doi.org/10.31652/2071-5285-2023-15

Alkhawajah, H.A., Alshami, A.M.Y., & Albarrati, A.M. (2025). The Impact of Autonomic Nervous System Modulation on Heart Rate Variability and Musculoskeletal Manifestations in Chronic Neck Pain: A Double-Blind Randomized Clinical Trial. *Journal of Clinical Medicine,* 14(1), 153. https://doi.org/10.3390/jcm14010153

Carini, F., Mazzola, M., Fici, C., Palmeri, S., Messina, M., Damiani, P. & et al. (2017). Posture and posturology, anatomical and physiological profiles: ov.erview and current state of art. *Acta Biomed.*, 88(1), 11-6. http://doi.org/10.23750/abm.v88i1.5309

Grygus, I., & Rebrov, V. (2025). Characteristics of the biogeometric profile of normal posture in women in early adulthood. *Physical Culture, Sports, and Health of the Nation: Collection of Scientific Papers,* 19(38)), 41-52. https://doi.org/10.31652/2071-5285-2025-19(38)-41-52

Harvey, R., Peper, E., Mason, L. & Joy, M. (2020). Effect of posture feedback training on health. *Appl Psychophysiol Biofeedback*, 45(2), 59-65. https://doi.org/10.1007/s10484-020-09457-0

Fathima, D., Lobo, J., Angioi, M., Błach, W., Rydzik, Ł., Ambroży, T., & Malliaropoulos, N. (2024). Sedentary Lifestyle, Heart Rate Variability, and the Influence on Spine Posture in Adults: A Systematic Review Study. Applied Sciences, 14(16), 6985. https://doi.org/10.3390/app14166985

Fedynak, N.V. & Vypasyak, I.P. (2025). Analysis of posture changes in women aged 36–45 caused by harmful factors in professional activity. *Pedagogical Academy: Scientific Notes.* https://doi.org/10.5281/zenodo.16906279

Kashuba, V., Samoiliuk, O., Rychok, T., & Koloniuk, K. (2025). Characteristics of the biogeometric profile of women in early middle age. *Sportyvnyi Visnyk Prydniprovia/Prydniprovia Journal of Sports Science*, (1), 52-66. https://doi.org/10.32540/2071-1476-2025-1-052

Kashuba, V.O., Samoilyuk, O.V., Shevchuk, O.M., Yarmolinsky, L.M., & Pokropivny, O.M. (2025). Features of the biogeometric profile of posture in women in early middle age. *Sports medicine, physical therapy, and occupational therapy*, (1), 67-77. https://doi.org/10.32782/spmed.2025.1.10

Kashuba, V., Ruban, L., Yefimenko, P., Honcharov, O., & Kanishcheva, O. (2025). Evaluation of the effectiveness of a corrective and rehabilitation program using postisometric relaxation and myofascial release exercises on the biogeometric profile of posture and cardiovascular system parameters of women I. Second period of mature age. *Physical Rehabilitation and Recreational Health Technologies*, *10*(1), 20–26. https://doi.org/10.15391/prrht.2025-10(1).03

Kozlovska, S.O., & Asaulyuk, I.O. (2023). Subjective assessment of the state of the musculoskeletal system, features of preferences, motives for physical education and health activities of women in the second period of adulthood. *OLYMPICUS.* 3. 89-98. https://doi.org/10.24195/olympicus/2023-3.14

Lazko, O., Byshevets, N., Plyeshakova, O. & et all. (2021). Determinants of office syndrome among women of working age. *Journal of Physical Education and Sport* ® (JPES), 21 (Suppl. issue 5), 2827–2834. https://doi.org/10.7752/jpes.2021

Lorbergs, A.L., , O'Connor, G.T., Zhou, Y., Travison, T.G., Kiel, D.P., Cupples, L.A., Rosen, H., & Samelson, E.J. (2017). Severity of Kyphosis and Decline in Lung Function: The Framingham Study. *The journals of gerontology. Series A, Biological sciences and medical sciences*, *72*(5), 689–694. https://doi.org/10.1093/gerona/glw124

Ruban, L., Vlasko, S., Dzhym, V., Honcharov, O., Sasko, I., Litovchenko, A., & Piven, O. (2021). Body posture biogeometric profile parameter variations of arm wrestlers owing to post-isometric relaxation. *Journal of Physical Education and Sport (JPES)*, 21(5), 2950–2955. https://doi.org/10.7752/jpes.2021.s5391

Samoiluk, O.V., Kashuba, V.O., & Grygus, I.M. (2025). Indicators of physical development of women in the early adult period with different types of posture. *Rehabilitation and Recreation,* 19(1), 252–265. https://doi.org/10.32782/2522-1795.2025.19.1.23

Sepehri, S., Sheikhhoseini, R., Piri, H., & Sayyadi, P. (2024). The effect of various therapeutic exercises on forward head posture, rounded shoulder, and hyperkyphosis among people with upper crossed syndrome: a systematic review and meta-analysis. *BMC musculoskeletal disorders*, 25(1), 105. https://doi.org/10.1186/s12891-024-07224-4

Silva, M.M., Santos, A.M. & Arossi, G.A. (2023). Body posture and the state of mood in women. *Rev Bras Cineantropom Desempenho Hum* 25:e95862. https://doi.org/10.1590/1980-0037.2023v25e95862

Sureshbabu, D., Rajalakshmi, R., Prakash, P., & Vasipalli, S.S. (2025). Text Neck and Its Association With Cardiac Autonomic Function, *Smartphone Addiction, and Psychophysiological Status in Young Adults. Cureus*, 17(4), e83025. https://doi.org/10.7759/cureus.83025

Quintero Santofimio, V., Clement, A., O'Regan, D.P., Ware, J.S., & McGurk, K.A. (2023). Identification of an increased lifetime risk of major adverse cardiovascular events in UK Biobank participants with scoliosis. *Open heart,* 10(1), e002224. https://doi.org/10.1136/openhrt-2022-002224

Wang, H., Gao, X., Shi, Y., Wu, D., Li, C., & Wang, W. (2022). Effects of trunk posture on cardiovascular and autonomic nervous systems: A pilot study. *Frontiers in physiology,* 13, 1009806. https://doi.org/10.3389/fphys.2022.1009806

Supplementary Information

Author's contribution

Larysa Ruban: Conceptualization, Methodology, Check, Data Curation, Supervision; **Victor Dzhym:** Methodology, Check, Data Curation, ; **Inna Torianyk:** Conceptualization, Methodology, Writing – Review And Editing; **Olena Anosova:** Writing – Rough preparation, Check, Data Curation; **Marina Dzhym:** Visualization, Investigation; **Mykhailo Sanin:** Software, Validation. All authors have read and agreed with the published version of the manuscript.

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Declarations

Conflict of Interest
The author declares that there is no conflict of interest.

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