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FUNDAMENTAL ASPECTS OF POSTURE IN THE CONTEXT OF THE SPATIAL ORGANIZATION OF THE HUMAN BODY

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Abstract

Ihor Vypasniak, Nazarii Fedyniak. Fundamental aspects of posture in the context of the spatial organization of the human body. SHEE "Vasyl Stefanyk Precarpathian National University", Ivano-Frankivsk.

Relevance. In a modern society focused on the values of individuality and self-expression, the spatial organization of the body acquires significance as a key characteristic of identity. Its formation is an important indicator of physical health and carries symbolic value. In addition, the spatial organization of the body becomes an integral component of the image, reflecting a person's ability to effectively present themselves in the social environment.

Research tasks. To study the fundamental aspects of posture in the context of the spatial organization of the human body.

Research results. The evolution of ideals of female beauty is a constant process that can be traced throughout the history of mankind. These ideals, integrating moral and aesthetic aspects, are reflected in artistic monuments of different eras, serving as historical documents of the cultural canons of female beauty.

Today, in connection with the transformations of modern civilization, the phenomenon of the spatial organization of the human body is becoming especially relevant. If earlier the canons of beauty were formed under the influence of art and philosophy, now they are

increasingly dependent on medical and social factors, which makes the study of posture as a component of the spatial organization of the body extremely important.

Conclusions. The problem of human body asymmetry is the subject of extensive study in scientific literature. It has been found that internal asymmetry of the spatial organization of the body, manifested in uneven distribution of the mass of organs and muscles, is the main factor that leads to the formation of asymmetric postural patterns. Symptoms of musculoskeletal disorders are important warning signals indicating negative changes in the body. One of the main indicators of deterioration of the biomechanics of the musculoskeletal system is destructive changes in the natural curves of the spinal column. These changes lead to increased tension and can cause the development of such pathologies as chronic pain and degeneration of the intervertebral discs.

Key words: spatial organization of the body; biomechanics of the musculoskeletal system; postural patterns; posture; disorder; vertical posture.

Statement of the scientific problem. The problem of understanding the spatial organization of the human body is becoming especially relevant in connection with the set of medical and social challenges of our time. Research has recorded an increase in the number of violations of the spatial organization of the body, especially in the conditions of intensive urban life, which indicates the negative influence of civilization factors. At the same time, in the context of increased attention to personal self-expression, the spatial organization of the body is gaining importance as a marker of individuality. It is also an important indicator of physical health and is associated with symbolic values formed in modern society. In addition, the spatial organization of the body becomes an integral element of the image, reflecting a person's ability to present himself in society [8, 20].

The purpose of the study is to generalize the fundamental aspects of posture in the context of the spatial organization of the human body.

Research tasks:

1. To study the fundamental aspects of posture in the context of the spatial organization of the human body.

Research methods. To achieve the set objectives, an analysis of scientific and methodological literature was used.

Presentation of the main research material. The evolution of ideas about the ideal components of the spatial organization of the human body is the result of the contribution of

different historical eras and social formations. The canon in this sense is a scientific paradigm and ideological basis that forms basic concepts [10].

Thus, in Leonardo da Vinci's treatise "On Divine Proportions" the concept of the "Vitruvian Man" is visualized – an ideally symmetrical figure with a straight spine, inscribed in the geometric figures of a circle and a square. Any asymmetry in this model was considered a sign of pathology [11].

Taking this into account, the symmetry of biokinematic relationships and their compliance with the harmony of the golden section are fundamental to ensuring the biomechanical stability of the human body [10].

Visual perception of the body is the most important factor in social identification and stratification. It determines the perception of the personal, psychological and cognitive qualities of an individual, influencing his or her integration into social groups. Having an athletic and aesthetically attractive physique is associated with such positive traits as strong-willed qualities, determination and aesthetic awareness. Therefore, body transformation is considered as a tool for social mobility [13].

Conversely, deviation from accepted body standards can lead to social alienation and stigmatization. Contemporary mass culture creates and disseminates strict canons of the "normative body" through mechanisms of social control. Women's bodies are particularly subject to this regulation, which is manifested in the constant public discussion of their parameters. This, in turn, leads to increased control and the use of numerous practices (epilation, hygienic care, shape correction) aimed at conforming to these norms [13].

The evolution of ideals of female beauty is a constant process that can be traced throughout the history of mankind. These ideals, integrating moral and aesthetic aspects, are reflected in artistic landmarks of different eras. They document the canons of female beauty formed in different cultural contexts. In the 15th century, during the Renaissance, the ideal of female beauty became an object of philosophical and aesthetic understanding, as evidenced by the treatise On the Beauty of Women. Subsequently, ideas about this ideal underwent significant changes, which emphasizes their cultural conditioning.

In the 20th century, which was characterized by significant social and scientific-technical changes, attention to the female body and its aesthetic canons did not diminish. A striking example is the "Miss Perfect Posture" contest, held in Chicago (USA) in May 1956. This measure is indicative, since the criteria for evaluating its participants were based not only on visual attractiveness, but also on objective medical data, in particular, X-ray images of the

spinal column. This fact illustrates the tendency to combine aesthetic ideas with scientific parameters in assessing female beauty [11, 18].

In the 21st century, the cultural canon of the body has expanded from thinness to an athletic physique, which, together with healthy eating, acts as a symbol of success. This pushes alternative body images to the margins, marking them as deviations from the norm. Research from developed countries shows that body dissatisfaction is more common among women than among men. This dissatisfaction, as a key element of modern body culture, is fueled by various social institutions (medicine, media, family) and serves as motivation for "working on oneself" [14, 17, 21].

In addition, bodily socialization in the youth environment is critically important for social integration. Constantly evaluating one's own body and the bodies of peers according to established cultural standards is a common practice that forms "hierarchies of acceptability" at both the personal and group levels.

Scientific literature has widely covered the problem of asymmetry of the human body [3, 4]. The internal asymmetry of the spatial organization of the body, associated with the distribution of the mass of organs and muscles, is a fundamental factor in the formation of asymmetrical postures [3, 4, 15].

Medical terminology defines "neutral posture" as a position with a straight spine and rigid joints [1]. This concept forms the concept of "ideal posture", which ensures maximum biomechanical efficiency with minimal muscle tension [2]. Importantly, ideal posture is also a condition for optimizing respiratory mechanics [2].

Given physiological asymmetry, the "neutral posture" is a state of equilibrium rather than absolute symmetry, allowing the body to be ready for movement. Loss of musculoskeletal balance, for example in the form of hyperlumbar lordosis [9], leads to structural deformation. This imbalance complicates movement, requiring compensation from other muscle groups and significantly increasing energy expenditure [9].

Variability of human body build during ontogenesis and changes in the condition of the spine are key to understanding the evolution of phylogenetic posture. This is confirmed by the study by J. Tuz, A. Maszczyk, A. Zwierzchowska, who analyzed the dynamics of anthropometric indicators, as well as the angular values of lordosis and kyphosis in young people over 10 years (2006–2016) [19]. The results obtained demonstrate significant variability and relationship between body build and posture. The following statistically significant changes were found: increase in body weight and hip circumference (especially among men); significant postural deformities; an increase in thoracic kyphosis in women by

96.15% and a decrease in lumbar lordosis in men by 52.65%; clear gender differentiation in such parameters as height, waist circumference, and lumbar spine angle; A moderate association was found between hip circumference and lumbar lordosis in women, and a weak association between height and thoracic kyphosis angle in men [19].

Symptoms of musculoskeletal disorders (MSDs) serve as natural warning signs of pathological changes in the body [5]. A study [5] found that the key risk factors for neck and shoulder pain in tablet users were musculoskeletal symptoms, gender, and work posture. The study findings particularly highlighted that poor posture (working with a tablet on the lap or without back support) was a significant risk factor for women. In addition, the study found that women were 2.059 times more likely than men to experience neck and shoulder pain. This was supported by statistics: 63.3% of women and only 53.3% of men reported current symptoms of MSDs [5].

In a study by M. Ferreira and colleagues [6], the posture of women with migraine and temporomandibular disorders was analyzed. For this, a quantitative photographic recording method was used, including the analysis of key anatomical points and measurement of the angles of cervical lordosis, thoracic kyphosis, and lumbar lordosis. The results showed that women with migraine and temporomandibular disorders have negative postural changes. Of particular importance is the increase in cervical lordosis, which is observed in patients with migraine, as well as a decrease in lumbar lordosis associated with temporomandibular disorders. In addition, the authors found specific patterns of postural changes: in patients with migraine only, they are localized predominantly in the cervical region, whereas in the presence of both conditions, compensatory changes are observed throughout the spine [6].

A study by A. Pal and P. Dhara [16] analyzed the prevalence of musculoskeletal disorders among female agricultural workers in India. Using the Nordic questionnaire, discomfort scale, and direct observation, it was found that a significant number of women had musculoskeletal disorders due to working conditions. The authors believe that the high prevalence of postural disorders is associated with long working hours and abnormal work postures. These postures, such as forward bending and squatting, lead to significant discomfort and negatively affect musculoskeletal conditions [16]. Based on these findings, the experts recommend a number of ergonomic interventions, including optimization of work/rest schedules, implementation of correct work postures, and use of improved hand tools to reduce the risks [16].

According to the findings of H. Gong et al. [7], destructive changes in the natural curves of the spinal column are the main indicator of deterioration of the biomechanics of the

musculoskeletal system, which leads to the development of pain and degeneration of the intervertebral discs. To confirm this, a photographic assessment of posture in the sagittal plane was carried out in a study involving 226 people (men and women). The results of the study revealed the following patterns:

- statistically significant differences were found between men and women in terms of neck, chest and hip angles. In men, these angles were smaller than in women, indicating a more pronounced cervical lordosis and thoracic kyphosis;
- men, compared to women, hold their heads higher and have a greater forward tilt of the pelvis, as indicated by a smaller hip joint angle;
- it was found that age correlates with changes in the angles of the neck, chest and knee, which confirms that involutional changes affect mainly the upper body and lower limbs. Age was not associated with changes in waist and hip angles. These results highlight that gender and age are the most important factors influencing biomechanical parameters of posture [7].

A promising direction for further scientific and practical research is the substantiation and testing of the "artificial control environment" toolkit in the process of health training for women in the second period of mature age.

Conclusions. The problem of human body asymmetry is the subject of thorough study. It was found that the internal asymmetry of the spatial organization of the body, manifested in the uneven distribution of the mass of organs and muscles, is the main factor predetermining the formation of asymmetric postural patterns. Symptoms of musculoskeletal disorders are important indicators signaling negative changes in the body. One of the main indicators of deterioration of musculoskeletal biomechanics is destructive changes in the natural curves of the spinal column. These changes lead to increased tension and can lead to the development of pathologies such as chronic pain and degenerative processes in the intervertebral discs.

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