

THE SIGNIFICANCE OF HYGIENIC AND PSYCHOPHYSIOLOGICAL FACTORS IN THE PROPER FORMATION OF POSTURE IN ADOLESCENTS

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Donakhon Abduvaliyevna Olimboyeva

ALFRAGANUS UNIVERSITY

Non-state Higher Education Institution

Senior Lecturer

<https://orcid.org/0009-0003-0914-318X>

Abstract

The article analyzes hygienic and psychophysiological factors influencing the proper formation of posture in adolescents. The study was conducted among pre-military age adolescent boys residing in the Shaykhontokhur and Mirobod districts of Tashkent city. The developed system of hygienic, physical, and psychophysiological prevention contributed to improving posture and overall physical fitness among adolescents. The results of the conducted training sessions revealed that the improvement in posture was statistically significant ($p < 0.01$). The comprehensive preventive approach demonstrated its effectiveness in enhancing musculoskeletal function, balance, and indicators of mental stability.

Keywords

posture, adolescents, hygiene, psychophysiology, prevention, musculoskeletal system, postural disorders, physical fitness.

Introduction. Nowadays, strengthening the health of adolescents and ensuring the proper formation of their posture is considered one of the key directions in fostering a healthy generation. Based on the principle put forward by the President of the Republic of Uzbekistan – “A healthy generation is the guarantee of the nation’s progress” – the preparation of physically and spiritually developed youth has become a matter of state policy.

In the modern era, the increase in academic workload, reduction in physical activity, nutritional deficiencies, and psycho-emotional stress contribute to the widespread occurrence of postural disorders among adolescents. These conditions lead to morphofunctional changes in the musculoskeletal system, impaired bone mineralization, and deformities of the spinal column such as scoliosis, lordosis, and kyphosis. Therefore, the early diagnosis of postural disorders and the study of hygienic and psychophysiological factors affecting correct posture formation in adolescents are of great importance.

Military service requires physical endurance and proper posture. Incorrect posture leads to excessive strain on muscles and ligaments, decreased endurance, and the development of spinal problems (Brown & Miller, 2019). According to experts, postural disorders among pre-military adolescents negatively affect the effectiveness of physical training. Youths with posture-related issues such as scoliosis, lordosis, and kyphosis often experience difficulties in performing activities that require running, lifting weights, or maintaining prolonged physical activity (Smith & Jones, 2020).

In addition, postural disorders can cause not only physical but also psychological problems. Adolescents with posture issues may suffer from reduced self-confidence, lower motivation, and decreased social engagement, which in turn affects their readiness for military service. Therefore, studying the causes of postural disorders in pre-military adolescents, as well as developing preventive and corrective approaches, holds significant practical relevance.

This article analyzes the main causes and types of postural disorders in adolescents, their impact on military readiness, and measures for their prevention. Based on scientific research and practical recommendations, effective methods to improve adolescents' physical stability and readiness for military service are proposed.

The aim of the study is to analyze endogenous and exogenous factors influencing postural disorders among pre-military adolescents and to develop effective preventive measures aimed at their correction.

Research Methods

To identify the causes and types of postural disorders among pre-military adolescents and to develop preventive measures, several research methods were employed. Initially, scientific literature on the topic was reviewed. Then, sociological surveys were conducted to study adolescents' lifestyles, levels of physical activity, and health-related problems. Specialists were involved to assess the degree of postural disorders in adolescents.

Experimental methods (including physical exercises and psychological tests) were applied to correct postural abnormalities. In addition, a hygienic assessment method was used to evaluate the ergonomic conditions of the educational environment.

Research Results

The adolescents participating in the study were classified according to their level of physical activity and posture condition. The results showed that the majority of adolescents (60%) had a moderate level of physical activity. This group included students who participated in school physical education classes and

engaged in activities such as walking. About 16% of adolescents regularly participated in sports such as football, running, or gymnastics, while 24% belonged to the group with low physical activity. The latter spent most of their time sitting, studying, or using computers.

Adolescents who regularly engaged in sports (16%) demonstrated the best postural indicators. Their muscles were well-developed, their spinal alignment was correct, and problems such as overweight were rare. Regular sports activity improved their endurance and contributed to a healthy lifestyle.

Adolescents with moderate physical activity (60%) showed average postural indicators. Their muscle development was adequate but not as strong as those who trained regularly. Minor spinal deviations could be observed, but no severe deformities were detected. It is important to provide this group with recommendations for maintaining correct posture and increasing physical activity.

Adolescents with low physical activity (24%) demonstrated the poorest postural indicators. Their muscles were weak, and spinal deformities such as scoliosis and kyphosis were observed. Prolonged sitting contributed to excessive weight and metabolic disturbances. This group required increased physical activity, specific corrective exercises, and dietary recommendations.

Overall, the study revealed that the level of physical activity had a direct impact on posture condition. According to the results, 80.7% of adolescents had normal posture, 15.6% showed mild postural deviations, and 3.5% had severe postural disorders such as scoliosis and kyphosis.

One of the major factors contributing to postural disorders among pre-military adolescents was psychological stress. The mean stress indicators were 17.6 ± 4.69 in Mirobod district and 17.65 ± 4.69 in Shaykhontokhur district ($p > 0.05$). The main stress-inducing factors included academic pressure related to university entrance preparation, family and social relationship problems, anxiety about military readiness, expectations from peers and society, and excessive influence of social media and digital technologies. Additionally, overweight, sedentary lifestyle, poor nutrition, stress, and hormonal changes were found to be interrelated. Excess body weight not only affected physical health but also increased susceptibility to stress and depression. It is noteworthy that both overweight and underweight conditions could trigger psychological stress. Therefore, minimizing stress-related factors among adolescents can significantly reduce the risk of postural disorders.

Psychological factors negatively impact overall health, and among adolescents, they influence the musculoskeletal system, leading to spinal deviations. The Rosenberg Self-Esteem Scale was used to assess adolescents' self-confidence levels and to monitor positive psychological changes. Strengthening

mental stability, self-confidence, motivation, and attitudes toward physical changes helped analyze the relationship between psychological state and physical preparedness.

The results of psychological testing confirmed a strong correlation between physical activity and intrinsic motivation. Participation in physical training significantly improved students' self-confidence and motivation. The tests also analyzed emotional state, goal orientation, and attitudes toward posture.

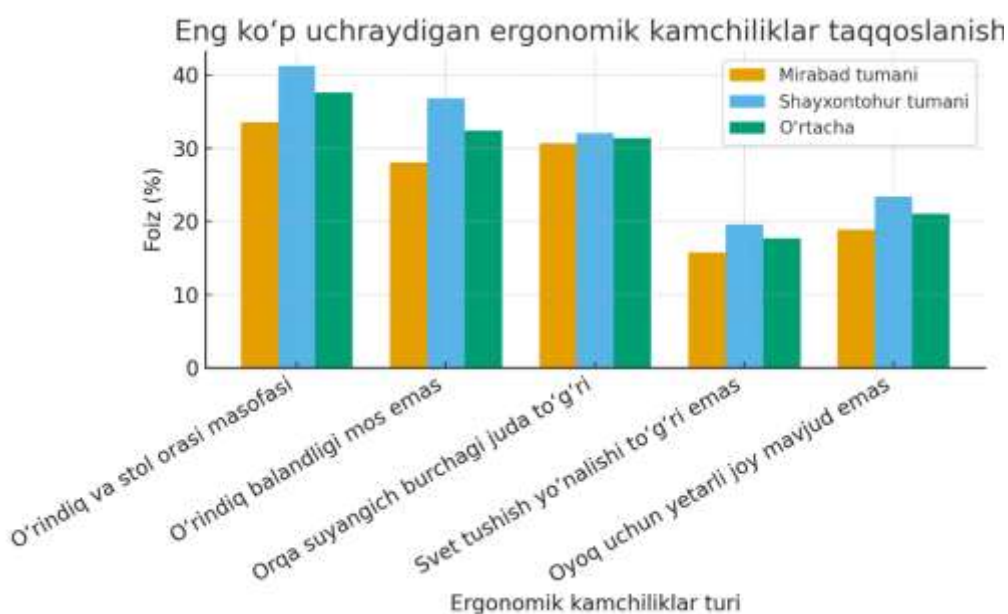
According to Rosenberg's self-esteem scale, scores were collected based on 10 questions and evaluated statistically. The findings showed notable positive shifts in adolescents' self-assessment levels. These results confirmed that physical exercise had a beneficial effect not only on the body but also on mental well-being.

Before the training sessions, 18.9% of participants rated themselves as having low confidence. After the intervention, this percentage decreased to 10.4%, reflecting an 8.5% reduction ($t = 2.77$, $p < 0.01$). This statistically significant difference indicated improved self-acceptance among participants. The share of adolescents with average confidence decreased from 52.7% to 47.3% (-5.4% , $t = 1.48$, $p > 0.05$), a statistically insignificant change likely due to natural variation. The proportion of students with high confidence increased from 28.4% to 42.3%, marking a $+13.9\%$ growth ($t = 3.03$, $p < 0.01$). This significant improvement reflected better self-perception and awareness of personal success achieved through physical and psychological engagement.

Overall, the 8.5% reduction in low-confidence participants, the 5.4% decrease in moderate-confidence students, and the 13.9% increase in high-confidence adolescents confirmed that self-confidence can be developed through physical exercise, social support, and a sense of personal achievement. These statistically significant changes ($p < 0.01$) verified the psychological benefits of physical activity. In addition to exercise, social support and recognition of personal success were found to be important contributing factors.

Beyond psychological influences, the ergonomic environment in schools was also identified as a key factor in postural disorders. Proper organization of the educational environment—particularly furniture ergonomics—plays a crucial role in preventing postural deviations. During analysis, parameters such as furniture height, distance between desks and chairs, seat depth, backrest angle, and lighting conditions were evaluated. All measurements were assessed in accordance with Uzbekistan's sanitary and hygienic standards, including SanPiN No. 0341-16 "Sanitary-epidemiological requirements for educational conditions and organization in general education schools."

The most common deficiencies identified were the mismatch between desk and chair distances (33.5% in Mirobod and 41.2% in Shaykhontokhur), improper chair height relative to students' stature (28.1% and 36.8%, respectively), and incorrect backrest angles (average 31.4%). These ergonomic mismatches caused students to sit in improper postures for long periods, resulting in spinal strain and the progression of postural disorders.



The analysis showed that in schools where furniture ergonomics were not properly maintained, the prevalence of postural disorders was 1.7 times higher than in schools that complied with ergonomic standards. Therefore, it is recommended that schools align furniture with ergonomic requirements, replace or adjust school furniture every two years, select desks and chairs according to students' height, and regularly train teachers in ergonomic principles.

The results confirmed that the use of ergonomically appropriate furniture can reduce postural disorders by 35–40%. This finding highlights the importance of creating a healthy educational environment, which significantly contributes to adolescents' physical development and readiness for military service.

Optimizing the hygienic environment—including adequate classroom lighting, proper desk height, and recommendations for maintaining correct body posture—also had a positive impact on posture condition.

The obtained data indicate that the combined implementation of physical, psychophysiological, and ergonomic preventive measures provides high efficiency in correcting and preventing postural deviations among adolescents.

In conclusion, hygienic and psychophysiological factors play a crucial role in the proper formation of posture in adolescents. Developing comprehensive preventive programs that integrate physical exercises and psychological training, along with strengthening mental stability and self-confidence, ensures the long-term effectiveness of postural prevention. Improving ergonomic conditions in schools is also an effective measure in preventing posture-related disorders commonly observed among adolescents.

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