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The Role of Mobilization Exercises in Forming and Maintaining Functional Joint Mobility and Biomechanics of Movement in Students

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ABSTRACT

Functional joint mobility is a key component of a person's physical health and determines their ability to perform a full range of motion in everyday and professional activities. During student age, when more and more time is spent on sedentary work, studying, and using digital devices, the risk of developing hypomobility increases. Functional joint mobility is a determining component of a person's physical health, as it provides optimal range of motion, helps maintain proper posture, and reduces the risk of pain and injury [1]. According to the American College of Sports Medicine (ACSM, 2022), more than 60% of young people aged 18–25 have signs of reduced mobility associated with prolonged sitting and low levels of physical activity.

Keywords: Biomechanics of Movements; Mobilization Exercises; Functionality; Joints

Introduction

Students who spend an average of 5 to 9 hours a day at the computer most often experience: decreased mobility of the thoracic spine, shortening of the muscles of the posterior thigh, limitation of internal rotation of the hip joints, increased muscle tone of the neck and upper back [2].

Sahrmann's Study (2017) Showed: hypomobility of at least one key joint increases the risk of developing muscle-fascial dysfunctions by 28–45%. This indicates the importance of regular mobilization exercises as a means of preventing functional disorders. Insufficient joint mobility can lead to muscle imbalance, impaired posture, chronic pain and reduced overall performance.

Purpose of the study. The purpose of the study is to determine the impact of mobilization exercises on the indicators of functional joint mobility in students, as well as to assess the effectiveness of implementing regular mobilization programs into the structure of physical activity and short daily mobilization complexes (5–10 minutes) into the educational regimen [3].

Results of Scientific Research

The analysis of scientific sources shows that mobilization exercises have a positive effect on the amplitude of movements in key joints - hip, shoulder, knee and ankle. They contribute to improving the elasticity of muscle-fascial structures, reducing tissue stiffness and increasing the biomechanical efficiency of movements. In a study by Kang et al., 2020, it was proven that the use of joint mobilization exercises 4 times a week for 5 weeks leads to: an increase in the amplitude of movements in the hip joints by 12–18%, an improvement in shoulder joint mobility by 10–15%, and a decrease in the feeling of stiffness by 30%. Similar results were observed among students who performed a set of 8 exercises: thoracic mobilization, shoulder girdle opening, "90/90 hip mobility", ankle joint mobilization, etc. According to a study by Cook & Burton (FMS Research Group, 2019), after a 6-week mobilization program, the average score on the "Deep Squat" test increased by 1–2 points, indicating improved integration of joint mobility and stability. In their experiment, Kim & Lee (2021) showed: 5-minute breaks with mobilization exercises every 2 hours of study reduce: trapezius muscle tension by 20–25%, low back pain intensity by 35%, eye and neck fatigue by 18%. Mobilization exercises activate proprioception and optimize the functioning of the neuromuscular system. It has been proven (Behm, 2018) that mobilization prevents "compensatory" movements that occur in case of hypomobility, thereby reducing the risk of overloading individual areas of the body. Systematic performance of mobilization exercises for 4–6 weeks allows to significantly increase the level of functional mobility of students regardless of the level of previous physical training.

Conclusion

Mobilization exercises are an effective and affordable means of developing and maintaining functional mobility of joints in students. Regular performance of 5–10-minute mobilization complexes: increases the amplitude of movements in key joints by 10–20%, reduces the risk of developing muscle-fascial dysfunctions, helps improve posture and reduce pain, and has a positive effect on the general well-being and performance of students. It is recommended to integrate mobilization complexes into the educational process and daily activities of young people as a preventive measure against hypodynamia and postural disorders.

References

1. Grinko V, Sapehina I (2022) Analysis of Students' Education on the Principle of Consent with Nature on the Example of Physical Education. Biomed J Sci & Tech Res 46(2).
2. Grynko V, Shepelenko T, Sapegina I, Dorosh M (2023) Education of students according to the principle of conformity to nature on the example of physical education. V Correspondence International Scientific and Practical Conference, Scientific researches and methods of their carrying out: world experience and domestic realities, pp. 754-756.
3. Grinko V, Kudelko V, Bodrenkova I, Dorofieieva T, Nazarenko I, et al. (2024) Therapeutic physical education in institutions of higher education in Ukraine. II Correspondence International Scientific and Practical Conference, SCIENCE IN MOTION: CLASSIC AND MODERN TOOLS AND METHODS IN SCIENTIFIC INVESTIGATIONS 35: 634.

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