

## **Bibliographical record**

DVOŘÁK, J. *Physiological movements of the spine during locomotion*. Prague: Charles University, 2nd Faculty of Medicine, Department of Rehabilitation and Sports Medicine 2021. 75 p. Thesis supervisor PhDr. Marcela Šafářová, Ph.D.

## **Abstract**

The diploma thesis *Physiological movements of the spine during locomotion* deals with the relationship between locomotion, spatiotemporal properties of gait and spinal movements. The theoretical part of the work summarizes the knowledge about the phylogenetic and ontogenetic development of the spine. The paper discusses the influences that affect the motility of the spine from intrauterine development to old age. The main part of the theoretical part is devoted to an overview of studies examining the movements of the spine during human locomotion.

The experimental part was performed by testing a group of younger ( $24.6 \pm 3.6$  years) and older adults ( $43.5 \pm 4.6$  years). Both groups consisted of 8 women and 8 men. A total of 32 volunteers were tested. Otto's spine distance, thoracic spine rotation, 95% COP standing, and spatiotemporal gait data were measured using a Zebris Rehawalk FDM-T. Thereafter, therapy was applied to the chest to affect the dynamics of movement. Finally, control measurements of all volunteers were performed.

Statistical data processing showed a statistically significant effect of therapy on Otto's distance in a group of younger and older volunteers. Furthermore, the applied intervention caused a prolongation of the step cycle, an increase in the maximum force 1 and 2 and an extension of the length of gait line in a group of elderly volunteers.

The presented work demonstrates the effect of physiotherapeutic intervention focused on the chest and thoracic spine. The effect is manifested especially in older volunteers, volunteers in whom walking may already be affected by physiological aging of the organism. Based on the results, it can be assumed that such an intervention has a positive effect on the musculoskeletal system of aging people and is a suitable means of optimizing the load on the hip and knee joints when walking.

## **Keywords**

Spine movement, walking, gait analysis, thoracic spine treatment