

Abstract

This thesis examines the influence of active exercise according to the concept of the Dynamic Neuromuscular Stabilization on local sensory perception in the mid-thoracic spine in elite athletes – cross-country skiers. It also describes the most common health problems in these athletes and assesses the impact of the integration of active exercise according to the DNS concept into everyday practice of cross-country skiers on the intensity and frequency of pain in cervical, thoracic and lumbar spine. It also presents theoretical knowledge about the concept of the Dynamic Neuromuscular Stabilization and interdependence of quality of sensory and motor functions.

Methods: The study included a total of 20 elite athletes – cross-country skiers aged 17-27, randomly divided into two groups. The training group integrated into their practice selected three exercises according to the Dynamic Neuromuscular Stabilization targeting segmental motion in the thoracic spine. A total of five measurements were performed on the quality of sensory perception during two months for all athletes. Furthermore, we evaluated the immediate effect of the therapy in the test group through the examination of sensory perception before and immediately after the treatment. At the beginning and at the end of the study each athlete completed the Young spine questionnaire, detecting the intensity and frequency of their back pain.

Results: Tactile and thermal perception reached the maximum values for each measurement for all athletes. In graphesthesia, two-point discrimination and vibration perception the training group shows significantly faster increase (for a two-point discrimination decrease) of values in time than the control group. The immediate effect of the therapy shows a statistically significant improvement only in two-point discrimination ($p = 0.021$). On the basis of the questionnaire we can state that in the training group the intensity of pain in all three areas of spine was significantly reduced compared to the control group ($p = 0.005$ cervical, thoracic, $p = 0.004$, $p = 0.014$ lumbar). The frequency of pain was reduced only in the thoracic area ($p = 0.011$).

Conclusion: The integration of active exercise according to the Dynamic Neuromuscular Stabilization to the practice of cross-country skiers has an impact on improving the quality of sensory perception in the mid-thoracic spine and on reducing the intensity of pain in the cervical, thoracic and lumbar spine and the frequency of pain in the thoracic spine.