

Results of Functional Spinal Examination of Prepubescent Students

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Introduction

Several studies have concluded that a sedentary lifestyle is spreading rapidly among the younger age group (Szigethy, 2020; Kun et al., 2019). A recent Health Behavior in School-Aged Children (HBSC) study found that less than one in five adolescents meet the World Health Organization's (WHO) physical activity recommendations (Jo Inchley et al., 2020). The physical inactivity of prepubescents contributes to the development of pathological changes in the spine and to an increase in the detrimental effects of pre-existing degenerations. The aim of this research, which was launched with an emphasis on prevention, is to examine the spine of the students in the sample and to identify the postural weaknesses that contribute to the development of the lesions. In the light of the results, it is extremely important to compile a targeted prevention program.

Materials & Methods

The study was conducted in November 2021 among 6th grade students of the Gárdonyi Géza Primary School in Győr, Hungary (n = 71). Using cross-sectional study, we studied the physiological curvatures of the spine in a standing position and under load (Matthias test). The Spinal Mouse was used to examine the spine. The instrument can examine the morphological characteristics and mobility of all vertebrae between C7 - S1 of the spine.

Results

The study included girls (n = 30) as well as boys (n = 41). Their average height was 155.2 cm (girl: 156.08 cm, boy: 154.29 cm). Their average body weight was 45.5 kg (girl: 46.7 kg, boy: 44.3 kg). The vertebral segments of the lower back (Th10/11, Th11/12, Th12/L1) and the lumbar spine (L1/2, L2/3) are in the age-appropriate normal range. The Th10/11 vertebral position showed a significant difference (p < 0.002) between girls and boys. In the case of girls, an increased lordotic curvature is seen in the lumbar spine compared to that of boys. Based on the results of the Matthias test, it can be concluded that the curvatures of the girls' spines are more maintained than those of the boys Th10/11 (p < 0.001), Th11/12 (p < 0.030), and also in the Th12/L1 transition (p < 0.041).

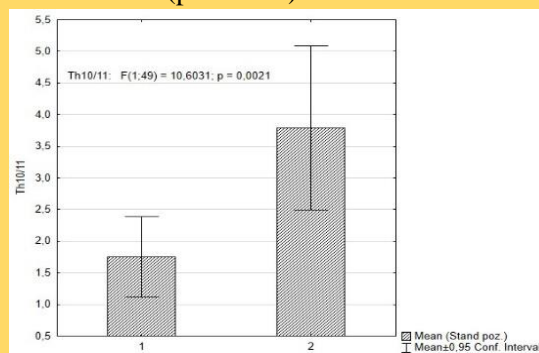


Figure 1.: Correlation between TH10/11 vertebral segments of female and male students

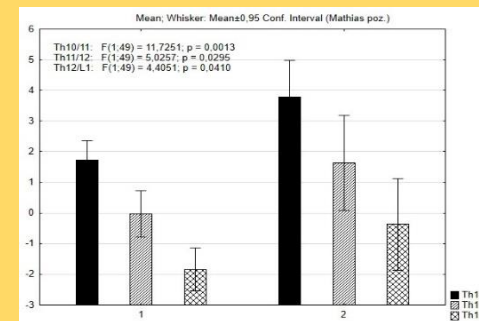


Figure 2.: Significant differences after performing the Matthias test

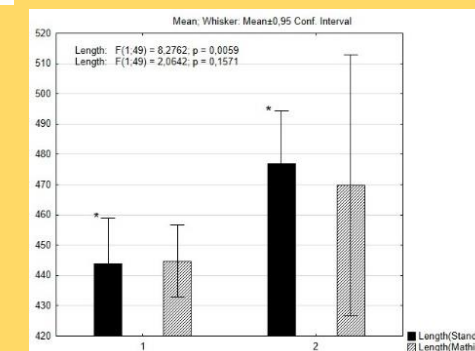


Figure 3.: Changes in the spine length of girls and boys after the Matthias test

Discussion

In addition to the differences due to the anatomical structure, it can be stated that the functional curvatures of the lower back and lumbar spine of boys are less maintained under load than those of girls. These segments are therefore the source of poor posture, so special attention should be paid to age-appropriate strengthening of the lower back, lumbar spine, and core muscles.