

## Summary

**Title:** Influence of muscle imbalances on the pelvic position in karate trainees

**Aim:** : The aim of this thesis is to contribute to the solution surrounding the problematic of the position of the pelvis. Also to compare the difference between the positions developed by the influence of muscle imbalances in a group of children aged from 11 – 13 years in sports clubs specializing in karate together with children from 5<sup>th</sup> – 6<sup>th</sup> grades in primary schools in the Ústí nad Labem district, children who do sports just for fun and occasionally.

**Methods:** : The main method of this empirical research was that of measuring the somatometric characteristics and the body composition (%BF) in children of middle school age, the method of examination by manual medicinal techniques for discovering the pelvic positions and the lumbar lordosis (Lewit, 2003) and the method of carrying out the diagnosis of the stabilisation function of abdominal muscles according to Kolář (2009) – the diaphragm test, the test of body flexion and the test of intraabdominal pressure. Another applied method was the 3D analysis of the movement for determining the range of the pelvic movement from maximal retroversion up to maximal anteversion. The movement of the pelvis in relation to the laboratory and the lumbar spine in relation to the pelvis was evaluated (lower limbs stretched, to the width of the pelvis).

**Results:** Considering the results of the body composition (%BF) we can confirm a significant relationship between the %BF and the BMI (karate trainees:  $r = 0,513$ ,  $r^2 = 26,37\%$ ; others:  $r = 0,844$ ,  $r^2 = 71,37\%$ )

In the diaphragm test, a statistically important difference between the groups was shown to exist (karate trainees and others)  $p = 0,00001$ . In the functional test – the test of body flexion, a significant difference between the groups was shown to exist (between karate trainees and others) – ( $p = 0,0018$ ).

On the contrary, no significant relation in the examination of the pelvis between the groups was found in the anteversion ( $p = 0,685$ ), lateral shift ( $p=0,672$ ), side tilt ( $p=0,668$ ), rotation ( $p=0,317$ ) and retroversion ( $p=0,564$ ). The results of the 3 D analysis of the movement showed, that the size of the range (regardless of whether medians, averages or standard deviations of the measured values were compared) did not differ significantly in the

comparison between both groups. The results could have been a limited range of data for the 3D analysis.

**Key words:** muscle imbalance, functional tests, 3D movement analysis