

## **Abstract**

**Title:** The influence of Tai Chi exercise on postural stability and its use as a prevention of falls in seniors

**Objectives:** The main objective of this thesis is to verify by dynamic computer posturograph Smart EquiTest System from NeuroCom®, whether the Tai Chi exercise has a positive effect on postural stability and prevention of falls in seniors. The secondary objective of the thesis is to evaluate the quality of life of seniors, practicing regularly Tai Chi, using the standardized WHOQOL-BREF questionnaire and to assess whether this exercise has a positive impact on the quality of life.

**Methods:** Nine probands mean age 62,53 ( $\pm$  7,05) years participated in this study. They practiced Tai Chi under the guidance of a professional instructor for 10 months regularly 60 minutes twice a week and they were also instructed to do it alone at home. The dynamic postural stability measurement was performed in the Kinesiology Laboratory of the UK FTVS on the Smart EquiTest System. *Limits of Stability, Motor Control Test and Sensory Organization Test* were chosen for this study. The measured data were then processed by the Neurocom Balance Manager Software. The WHOQOL-BREF questionnaire was chosen to measure quality of life. The following statistical methods were used to analyze the data obtained by Neurocom: Student's paired t-test, Wilcoxon test and the measure of clinical significance (Cohen's  $d$ ) were used for the analysis of the obtained data.

**Results:** The results of this thesis show that the Tai Chi practice has a positive effect on all measured parameters of the LOS protocol, except the Reaction Time parameter, does not affect the Latency parameter of the Motor Control Test protocol, has a statistically significant positive effect on the parameters COND 1, COND 4, COND 5 and COMP of the SOT protocol as well as the visual and vestibular ratio of the SOT protocol. The Tai Chi exercise also has a significant positive effect on the quality of life of elderly people.

**Keywords:** postural stability, Neurocom, senior, fall, Tai Chi