

## Abstract

**Title:** The effect of „brain gym“ exercise on tennis players' postural stability

**Aims:** The aim of this diploma thesis is to find out whether „brain gym“ exercise completed for 30 days has an impact on tennis players' postural stability

**Summary:** Altogether 12 women, 18-30 year olds, participated in the pilot study. The probands had completed a 30-day exercise intervention program which included a daily exercise for a maximum of 10 minutes. The postural stability was measured before and after the intervention using Neurocom Smart EquiTest System (Sensory Organization Test, Motor Control Test, Limits of Stability) and Standing Stork Test which evaluate the ability to balance vertically on the tip of one lower limb. The measured data were processed by the program Neurocom Data Analyzer, from which the data were subsequently transferred to Microsoft Excel 2010, SPSS 2007 and GPower 2019. To evaluate the effect of intervention the statistical methods – Shapiro-Wilk test, Student's paired t-test, Wilcoxon test were used and Cohen's d was used to determine clinical significance. The level of statistical significance was determined to  $\alpha = 0,05$ , when  $p < 0,05$  – statistical significance,  $p > 0,05$  – statistical insignificance. The values of clinical significance were set to: high significance –  $d > 0,80$ , medium significance –  $d = 0,50-0,79$ , and low significance –  $d = 0,20-0,49$ .

**Results:** A statistically significant difference was found only in the *Composite* parameter of Sensory Organization Test, where  $p = 0.00$ . Other tests were statistically insignificant. Clinically high significance was shown in Sensory Organization Test ( $d = 1,46$ ) and *Reaction time* parameter of Limits of Stability ( $d = 0,82$ ), medium significance in Motor Control Test ( $d = 0,51$ ) and low significance in *Directional control* parameter of Limits of Stability ( $d = 0,38$ ) and Standing Stork Test in right lower extremity ( $d = 0,27$ ). Standing Stork Test in left lower extremity was clinically insignificant. However, the individual test results showed that almost all of the overall values improved. The overall results of the work show that “brain gym” exercise has a positive effect on postural stability of tennis players.

**Keywords:** postural stability, brain gym, educational kinesiology, tennis, tennis players, balance, NeuroCom Smart EquiTest System, Standing Stork Test