

Abstract

Title: Monitoring the effect of short-term application of selected sleep hygiene rules on postural stability

Aims: The aim of this work was to monitor the influence of short-term application of selected sleep hygiene rules on postural stability using a Computerized Dynamic Posturography NeuroCom Smart EquiTest machine in healthy young individuals.

Methods: This work is characterized as an experimental pilot study. The research set consists of 20 individuals ($n=20$). The set was then divided into an experimental group ($n_1=10$) and a control group ($n_2=10$). The probands were approached based on previously defined criteria (healthy young adults, higher education and university students between 20 and 30 years of age, the average age in the experimental group ($n_1=10$) was $24,74 \pm 2,56$ years, the average age in the control group ($n_2=10$) was $25,39 \pm 2,97$ years,).

The method of proband choice was non-probabilistic selection the snowball method. The measurements were performed at the Laboratory of Applied Kinesiology of the Faculty of Physical Education and Sport, Charles University. A Computerized Dynamic Posturography NeuroCom Smart EquiTest machine was used to assess and evaluate the postural stability. The testing protocol included the following tests: Sensory Organisation Test, Motor Control Test, Limits of Stability test and a Rhythmic Weight Shift test. The measurements were taken twice in the span of one week using the Computerized Dynamic Posturography machine.

Intervention, or short-term application of selected rules of sleep hygiene, with a focus on light hygiene, was applied in the experimental group after the first measuring session for the duration of one week. Choosing light hygiene as a corner stone of sleep hygiene was inspired by up-to-date scientific findings about the effects of short wavelengths of light on the production of melatonin. Special short wavelengths of light blocking glasses were used as a tool for upholding the rules of light hygiene. Besides the postural stability, subjective sleep quality was also assessed using a modified version of the Pittsburgh Sleep Quality Index. This evaluation was done after both measuring session in both the experimental ($n_1=10$) and control ($n_2=10$) groups. The acquired data was processed using the NeuroCom Balance Manager Software, Microsoft Excel 2016 and chart-studio.plotly.com. A pair Student's t-test was used for statistical analysis. Significance level of $\alpha=0,05$ was set and used for evaluation of the statistically significant results.

Results: No statistically significant comparative results were discovered, therefore no hypothesis was confirmed. The Motor Control test (specifically the Latency COMPOSITE parameter) approached the preset significance level the closest, since the resulting p-value was 0.057.

Keywords: Neurocom Smart EquiTest, dynamic posturography, postural stability, sleep, sleep hygiene, light hygiene, blue light, chronobiology