

**Title:** Effect of selected acoustic stimuli on stability limits measured by CDP

**Objectives:** The aim of the thesis was to evaluate the impact of acoustic stimuli on the Limits of Stability (LOS) parameters in a young, healthy population aged 20–30 years. The study focused on comparing motivational music, non-motivational music, and white noise at an intensity of  $55 \pm 5$  dB. Both comparing against each other and against conditions without any acoustic stimulus.

**Methods:** The theoretical part of this thesis focuses on the anatomy of the vestibulocochlear organ, acoustics, postural functions, and the effect of sound on postural stability. In the practical part, an experimental quantitative study was performed on a research sample of young, healthy individuals ( $n = 22$ ) aged 20–30 years ( $25.14 \pm 2.37$ ) without acute or chronic health issues. Measurements were performed using the NeuroCom Smart EquiTest device, where the Limits of Stability (LOS) protocol was applied. Acoustic stimuli, including motivational music, non-motivational music, and white noise, were delivered via wireless headphones under controlled laboratory conditions. Statistical analyses were done using tests for significant differences at a significance level of  $\alpha = 0.05$ . Afterwards, clinical significance was evaluated using Cohen's  $d$ .

**Results:** For acoustic stimuli at an intensity of  $55 \pm 5$  dB, significant differences were found in the Endpoint Excursion (EPE) parameter when evaluating LOS in at least one direction compared to the conditions without acoustic stimuli ( $p < 0.05$ ). Significant differences were also found in the Movement Velocity (MVE) parameter under the same conditions.

No significant changes were found between the individual acoustic stimuli in any of the LOS parameters. According to clinical significance, a small to moderate effect was observed in the RT and MVL parameters when comparing motivational music and white noise. A small to moderate effect was found in the DCL parameter between motivational and non-motivational music.

**Keywords:** music, postural stability, limits of stability, motivational music, non-motivational music, white noise