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HealthTech Innovation Conference

Zabrze, 10 – 11th October 2022

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THE INFLUENCE OF SOUND STIMULI ON THE HUMAN BODY POSTURE

Keywords: posture stabilization, body posture control, noise, virtual reality, acoustic sensitivity

The aim of the research described in this paper was to determine the influence of noise on the stability of human posture in a virtual environment in relation to the real one.

The research group consisted of 18 people (10 women and 8 men, mean age 31 ± 7,7 years, height 172 ± 9 cm, weight 74 ± 12 kg). All respondents declared that they were healthy and had no problems with the locomotor system. During the measurements, participants were asked to stand still and upright on a stabilographic platform with their eyes open or closed. The noise was reproduced by means of two speakers placed on the floor in front of the platform. Each study lasted 60 seconds, with the analysis taking into account the middle measurement of 30 seconds.

The implementation of alternating forward and backward movements of the entire environment in the application made it possible to carry out the measurement in the conditions of a conflict of sensory stimuli. The amplitude of this movement was 30 cm.

The values of the asymmetry coefficient, determined on the basis of the COP path length for the left and right limbs, were analyzed. What can be observed is the inverted proportions of people with an increase and a decrease in this ratio. In the case of measurements with VR, in most people a decrease in the value of the coefficient after the introduction of noise is noticeable, which shows that the body movement was distributed more evenly on both limbs during the noise. A similar relationship was not observed in the analysis of the asymmetry coefficient determined on the basis of the load values under the left and right limbs.

The research presented in this paper did not show a statistically significant difference between the measurements of character stability in silence and in noise in the real environment. Statistically significant changes were observed in the case of measurements with moving VR, where there was an increase in the path length. It may prove that after introducing noise the person calmed down his movement and at the same time became more susceptible to the movement of the scenery, which the whole body follows. This interpretation is also supported by the increase in the range of COP movement towards the AP, as well as the reduced asymmetry between the COP movement under the left and right limbs in the majority of people. However, this requires an in-depth analysis, for example using frequency domain calculations.

The conducted research showed that the introduction of noise had a different effect on the subjects when they were in a virtual and real environment. The conclusions presented in the paper require further research and analysis with sounds of different parameters.