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POSSIBILITIES OF USING THE NEUROFORMA SYSTEM IN THE REHABILITATION OF UPPER LIMBS

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Virtual reality (VR) is a three dimensional image which, at some level, imitates the real world. The image is created with the use of information technologies and it can represent elements of both real and fictional world. At present, the Kinect device is more often used in rehabilitation. Neuroforma system can be mentioned as an example of using VR in rehabilitation with the use of biofeedback. Such systems are designed for the individual movement and cognitive exercises. It is applied in case of patients with the neurological diseases.

The aim of this work was an assessment of the possibilities for performance of motor exercises using the Titanis Neuroforma system in the rehabilitation of patients with the motor defects in the upper limbs.

The Neuroforma system was applied in the research where the recording of kinematics during two exercises at different level of difficulty was carried out. The inertial measurement system MVN Biomech by Xsens was applied for recording the kinematics of the movement of the upper limbs for the time of exercise with the Neuroforma system.

The kinematic values which were estimated were referred to a results of the test for two selected everyday activities (drinking from a cup and lifting an object to a stand) performed by a group of 17 healthy people (men, age: 22.76 ± 2.39 years, body height: 1.80 ± 0 0.07 m, body weight: 74.53 ± 8.9 kg).

The comparative analysis was carried for the maximum values of angles in the joints of the upper limbs as well as for the ranges of the movements obtained for the exercises with the use of Neuroforma system and selected everyday activities. It was proved that the ranges of movements in the joints of upper limbs during exercising with the Neuroforma system are similar or higher in the case of everyday activities. It was also observed that the maximum values and ranges of angles in the joints are not increasing linearly with the increasing of exercise level.

When using the Neuroforma system for rehabilitation, the degree of the patients motor defects must be taken into consideration in order to select a proper level of the exercise difficulty.