

## **ABSTRACT**

**Master's thesis topic:** Effects of the training with the krankcycle on wheelchair users

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This work was focused on training and strengthening of wheelchair users as a prevention of their health problems, a regulation of wrong physical and physiological mechanisms and an increase their fitness and motional skills. In this training the new instrument designed to strengthen the upper extremity and to improve the function of the cardiorespiratory system was used. This device is called krankcycle and its popularity has increased dramatically especially in the recent years.

Therefore it became the main purpose of this work to determine whether completing a 12-week continuous training with krankcycle will lead to changes in monitored parameters evaluating physiological, physical and motional skills of subjects and thus identify the true value of its use. At the same time, we wanted to verify previously confirmed advantages and effectiveness of this exercise especially for wheelchair users and reveal the krankcycle to them and the wider public as well.

Values of body composition were measured in the biomedical laboratory of the UK FTVS by caliperation of four skinfolds method on Bodystat QuadScan 4000 device. There was also made a test of anaerobic assumptions using 30 s Wingate test on a mechanical crank hand ergometer, the maximal concentration of lactate in blood was electrochemically determined on Biovendor Super GL equipment and the individual indexes of spirometric system were measured on Pony Graphic spirometric system. At the Centrum Paraple there was determined the muscle strength of upper extremity and trunk and was examined muscle shortening by Janda's muscle test. Basic anthropometric data were measured, joint flexibility was examined and subsequently the subjects underwent a specific test of individual motional skills. At the end they underwent entrance longterm endurance training with krankcycle, during which other functions of cardiorespiratory system were evaluated and subjective rate of their

perception for this workout was monitored using the Borg scale. Subsequently, according to the obtained entrance results and the individual requests of each subject the training plan was made.

We observed from the obtained results, that there was a significant increase in the muscle strength and leveling of lateral inequalities of muscles of upper extremity and also partially of the trunk. Individual changes in the structure and body composition have been individual. In some cases lung functions have improved and for all subjects motional abilities of the upper extremity (short-term endurance, coordination, speed) have slightly improved. During the study we have also noticed a large number of health complications during the study and thus confirmed the higher susceptibility of wheelchair users to these problems. These complications were disturbing the run of the training even the testing and among other problems, they brought an earlier termination of the research in one case.

**keywords: krankcycle, wheelchair user, paraplegia and tetraplegia, adaptation of the organism to workout, training methods**