

Description for the general public

The number of people over 65 years old continues to increase, and this is related to the “graying societies” phenomena, a sharp increase in the aging of the whole society. The current research achievements shows that people, over in their sixth decade of life, suffer for deterioration of the attention process, directly related with balance abilities. This process leads to an increase in serious falls in aging people, being one of the causes of disabilities in this age group. Therefore, the number of people suffering from deteriorating health, as a results of loss of balance, is still growing. Studies show that older people lose their stability especially when doing two things at the same time, for example going over uneven surface and repeating shopping list in their mind. Dual-task performance is a significant burden for complex cognitive processes, called executive functions. Thanks to the fluent operations of executive functions, a person is able to efficiently switch attention between activities, in such a way as not to lose control of any of them. Operations of this complex cognitive system is particularly weakened in the elderly.

Neuropsychological rehabilitation has begun to observe the significance of simultaneously cognitive and motor training and its impact on attentional problem reduction. The studies about this topic are still very few and far between. There is a lack of in-depth analysis about the impact of dual-task training on cognitive functioning. There has not been studies about how simultaneous motor and cognition exercises could help to improve functioning in everyday life and the efficiency of other cognitive process, non-directly training. The study aims to fill the gap and try to answer the question, whether simultaneous executive functions and balance control training can be more effective in the therapy of older people than individually performed cognitive and motor tasks.

The research will be conducted with the participation of 65 years old subjects, who will be divided into three groups: mental task training only, motor task training only and finally, mental and motor task training at the same time. In the other two groups, participants will not perform any exercises. In the second control group people 10 years younger than other participants, will be examined, in order to compare results with groups after training. In each group, before and after training, participants will be assessed psychologically, physiotherapeutically and assessed in the efficiency in everyday life. In the study cognitive-motor game will be used, in which, according to the training groups:

- 1) they plan a route through the maze, executed using computer keyboard (cognitive group),
- 2) they plan a route through the maze, executed using body balance on a special platform (cognitive-motor group),
- 3) they executive a route, designed by the researcher, on a posturography platform (motor group)

Training for all subjects in the experimental groups will be scheduled for four weeks, with a frequency of three times a week for 30 minutes. In each of the five groups there will be 20 participants.

In the framework of the proposed project there will be developed a completely new, comprehensive model of looking at the needs of older people. Finally, the research results will help understand the relationship between the motor activities and cognition functions in elderly people from the perspective of neuropsychology. They will also contribute to the development of complex therapeutic methods to rehabilitation and support of cognitive and motor functioning in seniors.