

ABSTRACT

Author: Marie Deyl

Title: Clinical evaluation of the effect of a home exercise program in a 70+ elderly population

Objective: The aim of this study is to investigate whether a daily exercise intervention in the elderly population over 70 years of age will have an effect on improving or deteriorating their postural stability. The tool used to verify this aim was statistically measured and analyzed data from computerized dynamic posturography before and after the intervention.

Methods: This is an experimental cross over study. The study was simply blinded to the investigator. 81 adults over 70 years old participated in the experiment, 18 were male and 63 were female with a mean age of 74.35 (± 3.5). The subjects were randomly divided into two groups, experimental (n=43) and control (n=38). Both groups underwent postural stability measurements on the NeuroCom SMART Equitest computerized dynamic posturography system, where we used 2 pre-set tests, the Limits of Stability test (LOS) and the Sensory Organization Test (SOT). The experimental groups then underwent a 3-month intervention in the form of a daily online exercise program designed by Mgr. Kateřina Macháčová, Ph.D.. The control group was not granted access to the exercise platform. After 3 months, a second follow-up measurement of both groups took place. Microsoft Excel version 365 and R software were used to analyze the data. Shapiro-Wilk test was used to check the normality of the data, paired t-test was used to compare the 1st and 2nd measurements, and two-sample t-test was used to compare the groups between each other.

Results: Statistically significant differences in the LOS test were found in the experimental group in the parameters MVL ($p=0.009$), EPE($p=0.033$) and MXE($p=0.022$). RT and DCL parameters were without significant difference. For the SOT test, differences were seen in equilibrium score COND3($p=0.038$), COND4($p=0.004$), COND5($p=0.001$) and COMP ($p=0.002$) in the experimental group. For COND 6, both groups improved (experimental $p=0.001$; control $p=0.031$). The experimental group further improved in the VIZ parameter($p=0.008$), both improved in the VES parameter (experimental $p=0.001$; control $p=0.031$). There were no significant changes in the parameters COND 1, COND 2 and SOM. All differences, either in LOS or SOT led to improvement. There was no deterioration in any

parameter. Daily online exercise for 3months has a positive effect on postural stability in the elderly population over 70 years of age.

KEYWORDS

postural stability; elderly population; sensory organization test; limits of stability; computerized dynamic posturography