E-Poster

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The Use of Virtual Reality (VR) Technology Devices in Gait and Balance Retraining Rehabilitation Program

Topic: Virtual Reality

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BACKGROUND

Balance impairment (BI) is a prevalent condition in middle-aged and elderly individuals. It is usually a consequence of central or peripheral nervous system dysfunction. Falls due to Blare a major problem in elderly population increasing morbidity and costs for healthcare systems. Virtual reality (VR) training is a promising intervention to address such patients. It uses computer-generated simulations that enable users to interact in various environments expanding the capacities of a rehabilitation program and enhancing motivation.

The purpose of this study is to investigate the effects of VR and advanced technology training on the rehabilitation outcomes of people with frailty and balance and gait impairment.

METHODS

Seven patients, who all had two or more fall episodes in the previous year, five males, with a mean age of 68 (52-79) years old all suffered from BI due to various conditions. Two of them had Parkinson disease, three post stroke patients, one suffered from lumbar degenerative disease and one with diabetes mellitus polyneuropathy. An eight-week rehabilitation program was implemented, with two therapeutic sessions/week. It consisted of biofeedback training of voluntary movement of the pelvis following pathways of VR elements on a TV screen using the THERA-trainerbalo device for 20 minutes, additionally 15 minutes of stationary bicycle and a 20 minutes personalized flexibility and strength training program. Two functional performance tests were conducted pre and post the intervention, Time Up and Go (TUG) test and Berg Balance Scale (BBS)to evaluate the improvement after training. A Visual Analog Scale (VAS) was also employed for patient satisfaction of the program.

RESULTS

The findings of this study (pic1) demonstrated an improvement of 2.17 sec in TUG test indicative of clinical importance (mean TUG test pre = 9.44 sec, Mean TUG test post = 7.27 sec). (pic2) Minimal clinically important difference for TUG test in patients with lumbar degenerative disc disorder is 2.1 sec. In the BBS we documented an increase of 5.14 degrees (29.71 pre, 34.85 post) but the results didn't reach the clinically important level (pic3). Minimal clinically important difference for Berg Scale for post stroke patients is 13.5. (The Mean VAS score was documented 9.71/10.

CONCLUSION

Rehabilitation program focused on balance is necessary to people with BI, most often to elderly population. Virtual reality devices could be a useful and pleasant tool, as part of such programs. More research needs to be conducted to prove the effect of such methods on the rehabilitation outcome.

Statement of Disclosures

None

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