



Service Priorities and Programmes Electronic Presentations

Convention ID: 611

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The effectiveness of Nintendo Wii-based gaming programs in decreasing fall risk for older people with mild cognitive impairment

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Keywords:

Elderly

Fall risk

Mild Cognitive Impairment

Introduction

The incidence of falls for the elderly residing in community dwellings has been found to be significantly high. Exercise has been used as an intervention to enhance physical strength and balance, it has also shown to bring about a reduction in the rate and risk of falls for the elderly. With advances in technology, virtual reality training has become highly popular as an alternative intervention approach because it requires not only gross motor movement and information processing, but also decision-making in respect of motor execution for response.

Objectives

Examine the effectiveness of Nintendo Wii-based gaming programs as an alternative in the treatment of fall problems in the elderly and to improve their cognitive functions when suffering mild cognitive impairment.

Methodology

A RCT was used for the study. Subjects were recruited over the period of October 2015 to February 2016 and placed randomly into two groups: (1) a Wii-based gaming training group and (2) a Control group. The subjects were recruited from the Specialist Out-Patient Clinic, with having been referred for fall prevention, aged 60 or above, with having had previous falls, and suffering from mild cognitive impairment. The subjects in the Wii-based training group participated once per week, for a one-hour session, for a continuous eight-week training protocol at the Occupational Therapy Department in the Prince of Wales Hospital. The subjects in the Wii-based training group also received conventional Occupational Therapy treatment which included home-based cognitive stimulation training. The subjects in the Control group received only the conventional Occupational Therapy and home-based cognitive stimulation training.

The outcome measures used for this study included the Berg's Balance Scale (BBS), the Fall Efficacy Scale International (FES-I), the Chinese version of Activities-Specific Balance Confidence (ABC Chinese) Scale, the Mini Mental State Examination (MMSE), and the Montreal Cognitive Assessment (MoCA). Given the small sample

size of this study, a non-parametric test was used to analyse the results, between the groups (Mann Whitney U-test), and within the groups (Wilcoxon Signed Rank test).

Result

20 subjects were recruited and 10 were allocated to each group. The ages ranged from 60 to 87 and the male to female ratio was 13:7. When using the Mann-Whitney U test, a significant difference was noted between the Wii-based training group and the Control group. Subjects who participated in the Wii-based gaming program displayed better results in the MMSE, the BBS, and the ABC Chinese Scale. The responses for the patient satisfaction questionnaires indicated there were no falls recorded during the study period and that cognitive functions were improved. The subjects also commented that they enjoyed the training. In conclusion, the Wii-based gaming program used in this study proved to be an effective treatment in helping to improve balance and cognitive functions.