



Service Priorities and Programmes
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Effectiveness of Virtual Reality in Balance Training in Stroke Rehabilitation: A Pilot Study

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Introduction

Background With the emergence of virtual reality and interactive video gaming as a new approach in stroke rehabilitation, commercial gaming consoles have been adopted in many clinical settings due to their easy accessibility and low cost. However, evidence of the effectiveness of video gaming on balance training in stroke is limited.

Objectives

Objectives 1) To evaluate the effectiveness of the virtual reality (VR) game system, Xbox360 Kinect, in balance training in patients with stroke. 2) To investigate the effectiveness of balance training with the game system in ambulation and functional capacity.

Methodology

Methodology This was a randomized controlled pilot study. Outpatients of the Hong Kong Buddhist Hospital with primary diagnosis of cerebrovascular disease with onset > 1 month, MMSE \geq 18, managed to stand independently for \geq 5 minutes and could walk independently for \geq 15 meters with or without aids, were recruited. Subjects with posterior circulation stroke, vestibular disorder, paroxysmal vertigo, unstable medical conditions and significant orthopedic and pain problems in lower limbs were excluded. Consented subjects were randomly allocated into either the virtual reality training (VRT) group or the conventional physiotherapy training (CPT) group. CPT group received conventional physiotherapy training while VRT group received balance training with VR game system in addition to conventional physiotherapy training. Both groups received 1-hour training twice a week for 6 weeks. Evaluations were performed at baseline and at the end of 6-week training. Primary outcome measures included Berg Balance Scale (BBS) and Sensory Organization Test (SOT) whereas the secondary outcome measures included 10-meter walk test (10MWT) and Modified Barthel Index (MBI).

Result

Results: Fourteen subjects, 8 male and 6 female with mean age 69.14(2.73) years (VRT group), and 68.86(8.25) years (CPT group) completed the training. There was

statistically significant improvement in BBS, SOT, 10MWT and MBI ($p < 0.05$) in both CPT and VRT group after the 6-week training. For between-group comparison, significant difference was demonstrated in SOT test ($p < 0.05$) except the sub-test of standing on a stable surface with eyes open. However, there were no significant between-group differences detected in BBS, 10MWT and MBI. Conclusion Balance training with VR game system may further improve the balance during standing. The commercial game console, Xbox 360 Kinect system can be an alternate low-cost VR device for balance training in stroke rehabilitation.