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Efficiency of Virtual Reality Exercises with Nintendo Wii System on Balance and Independence in Motor Functions in Hemiparetic Patients: A Randomized Controlled Study

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Abstract : The aim of this study was to examine the efficiency of virtual reality exercises with Nintendo Wii system on balance and independence in motor functions. This randomized controlled assessor-blinded study included 23 stroke inpatients with hemiparesis all within 12 months poststroke. Patients were randomly assigned to control group (n=11) or experimental group (n=12) via block randomization method. Control group participated in a conventional balance rehabilitation programme. Study group received a four-week balance training programme five times per week with a session duration of 20 minutes in addition to the conventional balance rehabilitation programme. Balance was assessed by the Berg's balance scale, the functional reach test, the timed up and go test, the postural assessment scale for stroke, the static balance index. Also, displacement of centre of pressure sway and centre of pressure displacement during weight shifting was calculated by Emed-SX system. Independence in motor functions was assessed by The Functional Independence Measure (FIM) ambulation and FIM transfer subscales. The outcome measures were evaluated at baseline, 4th week (posttreatment), 8th week (follow-up). Repeated measures analysis of variance was performed for each of the outcome measure. Significant group time interaction was detected in the scores of the Berg's balance scale, the functional reach test, eyes open anteroposterior and mediolateral center of pressure sway distance, eyes closed anteroposterior center of pressure sway distance, center of pressure displacement during weight shifting to effected side, unaffected side and total centre of pressure displacement during weight shifting ($p < 0.05$). Time effect was statistically significant in the scores of the Berg's balance scale, the functional reach test, the timed up and go test, the postural assessment scale for stroke, the static balance index, eyes open anteroposterior and mediolateral center of pressure sway distance, eyes closed mediolateral center of pressure sway distance, the center of pressure displacement during weight shifting to effected side, the functional independence measure ambulation and transfer scores ($p < 0.05$). Virtual reality exercises with Nintendo Wii system combined with a conventional balance rehabilitation programme enhances balance performance and independence in motor functions in stroke patients.

Keywords : balance, hemiplegia, stroke rehabilitation, virtual reality
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