

Abstract:

We evaluated the effectiveness of two virtual reality therapies (VRT) with visual biofeedback, Armeo Spring® upper limb exoskeleton (Armeo) and Homebalance® interactive system (Homebalance), in early post-stroke rehabilitation. Using a randomized controlled study design, participants within 30 days after stroke with arm paresis (Armeo study) or with balance problem (Homebalance study) were assigned either to the respective intervention group (Armeo IG n=25; mean age 66.5 years, and Homebalance IG n=25; mean age 69.6 years) performing VRT instead of conventional physiotherapy or to the control group (Armeo CG, n=25, mean age 68.1 years, and Homebalance CG, n=25, mean age 65.9 years) having conventional physiotherapy only. Montreal Cognitive Assessment (MoCA), Functional Independence Measure (FIM), Fugl Mayer Assessment–Upper Extremity Scale (FMA-UE), Modified Rivermead Mobility Index (m-RIM) and Berg Balance Scale (BBS) were performed before and after the 3-week therapy with 12 therapies. Results of participants <65 and ≥65 years old were compared. Acceptance of both VRTs was evaluated by self-rated questionnaire. In the Armeo study, paretic upper arm function improved significantly in both IG and CG groups, the improvement in FMA-UE was significantly higher in Armeo IG as compared to CG (p=0.02) and patients ≥ 65 years old presented equal magnitude of improvement. In the Homebalance study both IG and CG improved significantly in BBS, older participants didn't have worst results than younger ones. The acceptance of the new virtual reality therapies by older people was generally good.

Keywords: early neurorehabilitation, virtual reality, elderly, stroke