

The Effects of the Rehabilitation Exercise Program on Functional Movement for Children with Brain Injuries: A Single-Case Experimental Design Approach

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Abstract

Study design: A Single-Case Experimental study. **Setting:** Children with brain injuries often experience motor dysfunction, which affects sensory integration and functional movement. The Selective Functional Movement Assessment (SFMA) is a practical tool for diagnosing movement dysfunctions, but its application in the rehabilitation exercise program for children with brain injuries is underexplored. **Participants:** Twelve children (mean age, 8.9 years) with brain injuries who participated in a 12-week rehabilitation exercise program. **Interventions:** The Selective Functional Movement Assessment (SFMA) is a diagnostic tool used to identify dysfunctional movement patterns and guide their rehabilitation for functional improvement. **Main measures:** Pre and post intervention scores were analysed using paired *t*-tests. Statistical significance was defined as $p < 0.05$. **Results:** Improvements were found in multi-segmental flexion (MSF) and multi-segmental rotation (MSR) scores ($p < 0.009$ (1.08 ± 1.54) and 0.025 (1.08 ± 1.41), respectively), but no changes were observed in other movement patterns. Multi-segmental flexion (MSF) and multi-segmental rotation (MSR) are critical for postural control and balance, which are often impaired in children with brain injuries due to sensorimotor integration difficulties. The rehabilitation exercise program positively impacted motor coordination and sensorimotor integration by incorporating complex movements. **Conclusion:** The rehabilitation exercise program was effective in improving functional movement, particularly in