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Effectiveness of Interactive Neuromotor Training Versus Sensory Integration-based Exercise Training on Balance, Motor Function and Quality of Life in Individuals with Traumatic Brain Injury: A Quasi-experimental Study

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ABSTRACT

Introduction: Traumatic Brain Injury (TBI) often results in impairments in balance, motor function, and quality of life. Interactive Neuromotor Training (INT) and Sensory Integration based Exercise Training (SIET) are promising rehabilitation approaches for improving these outcomes. However, there is limited evidence comparing the effectiveness of these interventions in individuals with TBI.

Aim: To compare the effectiveness of INT and SIET on balance, motor function, and quality of life in individuals with TBI.

Materials and Methods: A quasi-experimental design was used with 28 participants (aged 18–55 years) diagnosed with mild to moderate TBI. Participants were randomly assigned to either the INT (n=14) or the SIET group (n=14). Pre- and post-intervention assessments were conducted using the Berg Balance Scale (BBS) for balance, the Fugl-Meyer Motor Assessment (FMMA) for motor function, and the Quality of Life after Brain Injury (QOLIBRI) scale for quality of life. Statistical analysis was performed using paired t-tests and independent t-tests.

Results: Both groups showed significant improvements in balance, motor function, and quality of life ($p<0.05$). The INT group demonstrated greater improvements in all outcome measures compared to the SIET group. The INT group showed a larger increase in balance (BBS) and motor function (FMMA), and more pronounced improvements in overall quality of life (QOLIBRI) scores.

Conclusion: INT is more effective than SIET in improving balance, motor function, and quality of life in individuals with TBI. Both interventions, however, provide significant therapeutic benefits, suggesting that they can be used as part of a comprehensive rehabilitation program for TBI patients.

Keywords: Berg Balance Scale, Fugl-Meyer motor assessment, Quality of life after Brain Injury scale