

Evaluating the Efficacy of a Structured Intervention Programme on Physical and Neurological Frailty in Older Adults: Integrating Motor and Cognitive Rehabilitation through a Multidimensional Perspective

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ABSTRACT

Introduction: For comparison, 7-16% of older adults (65 years and older) in the community are frail and are at higher risk of falls, hospitalisation, disability and death. This condition is caused by the progressive loss of the physiological reserve of different systems. Mild Cognitive Impairment (MCI) associated with physical frailty is called “*dual domain syndrome*”. In this condition, there are bidirectional pathophysiological mechanisms between neurocognitive decline and physical deterioration. Management approaches remain silo-based and fail to consider the interrelated and reinforcing nature of the patient's condition.

Aim: This study aims to compare the effectiveness of a six-week structured multidimensional intervention (cognitive rehabilitation+physical exercise) to standard care in the reduction of neurological and physical frailty, in improvement of functional mobility and in improvement of health-related quality of life.

Materials and Methods: Mild to moderate frailty (Fried Frailty Phenotype score 1-4) and MCI (MoCA 19-25) were present in 100 adults who completed a Randomised Controlled Trial (RCT) in a parallel-group design with an assessor-blinded design. There was an even number of participants in the intervention and control groups (n=50). The 6-week treatment consisted of cognitive stimulation,

balance training, strength training and dual-task motor-cognitive exercises. There were a total of 18 sessions. The control group received health education and low-intensity stretching. Since the data was found to be non-normal, non-parametric tests (Wilcoxon Signed-Rank test and Mann-Whitney U test) were used.

Results: There was no loss of data due to attrition. Significant improvements were shown by the intervention group in all outcomes ($p<0.001$). Improvements in MoCA were 3.04 points (SD=0.83), Timed Up and Go (TUG) was 2.21 seconds (SD=0.43) faster, and SF-36 was 10.62 points (SD=3.26) faster than before. The Fried score went down by 1.66 points (SD=0.48). For all participants in the intervention, there was improvement in all measures. The distribution of the TUG test result did not overlap and the maximum effect showed 0.000, which resulted in very significant differences between the groups (all $p<0.001$).

Conclusion: Older adults with physical and cognitive frailty can benefit greatly from a six-week integrated dual-domain rehabilitation program, which enhances their frailty, cognition, mobility, and overall well-being. It is recommended that this program be part of common geriatric care routines.

Keywords: Cognitive fragility, Dual-task training, Multidimensional rehabilitation, Older adults, Physiotherapy.

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