

Exercise for Improving ADL in Frail Older Adults: Therapeutic Validity and Adherence Show No Effect on Outcomes – A Meta-Analysis

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Purpose: Frailty in older adults impairs activities of daily living (ADL). While exercise interventions improve factors like muscle strength and physical function, their direct impact on ADL is unclear. This review aims to assess the effectiveness of exercise on ADL and identify the most beneficial exercise interventions.

Methods: A systematic search in five databases included randomised controlled trials on frail adults (60+) comparing exercise interventions to usual care, with ADL as an outcome. Methodological quality was assessed using the Cochrane Risk of Bias (ROB) tool. Meta-analyses were performed using random effects models, with heterogeneity assessed by the I^2 index. Subgroup analyses were conducted based on ADL-measurement tool, ROB, therapeutic validity (i.e. whether the intervention conformed to exercise recommendations for frequency, intensity, volume, and duration), adherence, and the combination of therapeutic validity and adherence.

Results: Out of 5,975 records, 24 papers (20 studies) met inclusion criteria. Two studies had high ROB. Exercise improved ADL (standardised mean difference = 0.59) but heterogeneity was high ($I^2 = 83\%$), partly explained by measurement tool and ROB. Studies with low ROB ($n = 2$) showed low heterogeneity ($I^2 = 0\%$). Studies assessing performance-based ADL using the Physical Performance Test ($n = 3$) and studies assessing ADL via the KATZ index ($n = 2$) also demonstrated low heterogeneity ($I^2 = 0\%$). Higher therapeutic validity and/or adherence did not necessarily lead to greater ADL improvements. Notably, interventions with high therapeutic validity showed lower adherence, suggesting that higher exercise demands reduce adherence.

Conclusion: Exercise may enhance ADL in frail older adults, but high heterogeneity limits firm conclusions. Performance-based ADL assessments, which mimic daily tasks, may better detect exercise-related improvements. Unexpectedly, higher therapeutic validity and/or adherence do not yield greater effects. Moreover, therapeutic validity appears to be inversely related to adherence. Effective interventions should therefore include a gradual progression to balance therapeutic validity with adherence. A deeper understanding of the underlying mechanisms is needed.

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