

Exercise interventions for treating sarcopenia - a systematic review and meta-analysis of controlled trials

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Introduction: Sarcopenia is defined as a substantially loss of muscle mass along with a reduction of strength and functional ability. No consensus exists on how sarcopenia is best treated. The primary objective of this review was to estimate the effectiveness of exercise therapies for improving physical performance (e.g. gait speed and chair stand) in individuals with sarcopenia.

Results: Nineteen trials were included of which fourteen (653 participants) with exercise interventions versus control were meta-analyzed. Every overall effect estimate favored exercise over control, with the standard mean difference (SMD) for objectively evaluated functional ability being 0.71 (95% CI: 0.52 to 0.91), 0.71 (95% CI: -0.3 to 0.72) for aerobic capacity, 0.53 (95% CI: 0.27 to 0.79) for muscle strength, while the SMD for muscle mass was 0.22 (95% CI: 0.02 to 0.43).

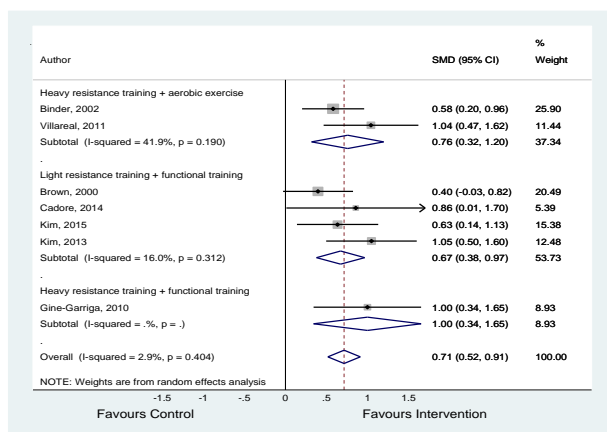


Figure 2 Forest plot of the effect of exercise therapy on functional capacity, stratified by type of exercise. Weights are from a random-effects analysis. Subtotal effects and overall effect is shown with 95% confidence interval. SMD = Standardized mean difference.

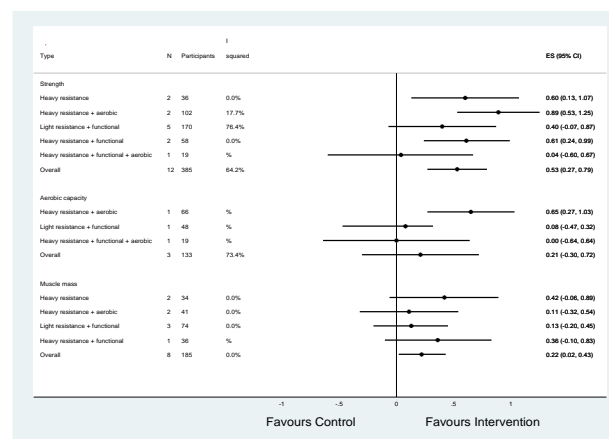


Figure 1 Forest plot showing pooled ES of different intervention types on measures of strength, aerobic capacity and muscle mass, stratified by type of exercise. Weights are from a random-effects analysis. Subtotal effects and overall effect is shown with 95% confidence interval. SMD = Standardized mean difference.

Methods: Four electronic databases (PubMed, Embase, CINAHL and CENTRAL) were systematically searched from inception to January 2016 to identify relevant randomized controlled trials and controlled trials. The reference lists of the included trials were additionally checked. Two reviewers independently evaluated the eligibility of trials and the included trial's methodological quality using the Cochrane risk of bias tool. Random effect meta-analyses were performed. The quality of evidence was evaluated using the approach by GRADE (the Grading of Recommendations Assessment, Development and Evaluation tool).

Conclusion: Low quality evidence indicates that exercise therapy is a moderately effective intervention, in terms of objectively measured physical performance, for treating individuals with sarcopenia. Low, very low and low quality evidence show that exercise therapy has a moderate, moderate and small benefit on, aerobic capacity, muscle strength and muscle mass, respectively, in the sarcopenic population. Risk of bias and small sample sizes in the included trials prohibits a strong conclusion.