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From Bibliometrics to Meta-Analysis: The Effects of Exercise and/or Nutritional Interventions on Older Adults with Sarcopenic Obesity

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ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Data extraction.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2025110044

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 16 November 2025 and was last updated on 16 November 2025.

INTRODUCTION

Review question / Objective This study aims to analyze the current research landscape and trends in exercise and/or nutritional interventions for SO in older adults. By systematically evaluating the effects of these interventions, we seek to provide an evidence-based foundation for future research.

Condition being studied The Effects of Exercise and/or Nutritional Interventions on Sarcopenic Obesity in Older Adults.

METHODS

Participant or population Older adults diagnosed with Sarcopenic Obesity.

Intervention Exercise interventions (including Exercise modalities include aerobic exercise, resistance exercise, and combined aerobic and resistance exercise), nutritional interventions (including protein and vitamin D supplementation), or a combination of both.

Comparator Healthy education, usual care, standard treatment and wait-list group.

Study designs to be included RCT only.

Eligibility criteria The skeletal muscle index is one of the important indicators for diagnosing sarcopenia. Bioelectrical impedance analysis has been widely used to assess the skeletal muscle index in individuals with sarcopenia, with sarcopenia defined according to the consensus reported by EWGSOP2 and AWGS. Obesity is defined by body mass index and body weight.

The exclusion criteria were as follows: (1) Studies lacking a clearly defined design or not classified as RCTs; (2) Studies without extractable outcome data; (3) Unavailable full text; (4) Duplicate publications; (5) Studies that did not employ validated or professional assessment tools; (6) Incomplete reporting of outcome measures.

Information sources Web of Science Core Collection, Cochrane Library, PubMed, Embase, Scopus.

Main outcome(s) Comparison: Health education or no-intervention control groups; (4) Outcomes: Body mass index (BMI), body fat percentage (BF%), appendicular skeletal muscle mass (ASM), handgrip strength (HGS), and gait speed (GS).

Quality assessment / Risk of bias analysis The risk of bias for each included RCT was assessed in accordance with the Cochrane Collaboration's tool. There were 7 domains that were assessed for each study: random sequence generation. Allocation concealment blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective reporting, and other bias. The risk of bias was given one of three rankings. "high risk"(red)"low risk"(green), or "unclear risk" (yellow).

Strategy of data synthesis 1) Analyzing Tools: Review Manager 5.4

2) Statistical analyses were conducted using Review Manager (RevMan) version 5.4, with all data treated as continuous variables. Due to variability in measurement instruments across studies, standardized mean difference (SMD) was employed, along with 95% confidence intervals (CIs) for effect size estimation. The selection of the effect model was guided by the degree of heterogeneity, as assessed by the I^2 statistic. An I^2 value below 50% and a P-value greater than 0.05 indicated low statistical heterogeneity, warranting the use of a fixed-effect model. In cases where $I^2 \geq 50\%$ or $P \leq 0.05$, a random-effects model was applied, and potential sources of heterogeneity were investigated. When significant heterogeneity was detected, subgroup analyses were performed based on factors such as intervention type and duration. This was conducted separately for publications between 2000 and 2025 using a retrospective approach and underwent qualitative analysis to determine whether further quantitative analyses were necessary.

4) Due to the diverse range of interventions, it is not feasible to eliminate their inherent heterogeneity. Therefore, we recommend utilizing a random effects model to conduct the analysis.

Subgroup analysis According to age, exercise intervention methods, nutrition intervention method, etc.

Sensitivity analysis Perform sensitivity analysis using Review Manager 5.4, reflecting the sensitivity of an article by observing the change in effect size after removing that particular study.

Country(ies) involved China.

Keywords Sarcopenic Obesity; Exercise Intervention; Nutritional Supplementation; Bibliometric Analysis; Meta-Analysis.

Contributions of each author

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