INPLASY

EFFECT OF STRENGTH TRAINING IN ELDERS WITH ALZHEIMER OR DEMENTIA COMPARED TO OTHER TRAINING PROTOCOLS IN IMPROVING COGNITION AND DAILY LIFE ACTIVITIES: A SYSTEMATIC REVIEW

Corresponding author:
António Mendes Braz

antoniomendesbraz@gmail.com

Author Affiliation:
ISCE—Polytechnic University of Lisbon and Tagus Valley, Department of Sport Sciences, 2620-379 Lisbon, Portugal.

Braz, AM; Sousa PM; Pinheiro, V; Costa, A; Montoro, R.

ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Data analysis.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202520046

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 8 February 2025 and was last updated on 8 February 2025.

INTRODUCTION

*R*eview question / Objective To compare the effects of strength training in older adults with Alzheimer or Dementia with other training protocols in improving cognition and daily life activities.

Rationale Strength training is effective in developing strength, power, increasing muscle mass, improves balance and response time in elderly people. It also promotes significant neuromuscular adaptations, improving physical functionality, contributing to autonomy and independence, thus improving daily life activities in elders. We aim to conduct a systematic review to determine whether cognitive improvements, along with these observed benefits, are also evident in this population.

Condition being studied Alzheimer or Dementia.

METHODS

Search strategy Electronic databases (Cochrane, PubMed, Scopus, Web of Science and SPORTDiscus) were searched for relevant publications. Keywords and synonyms were entered in various combinations in all fields and title/abstract: [Title/Abstract] strength training AND aerobic training OR resistance training in elders with Alzheimer OR Dementia AND improvements in cognition AND memory AND daily life activities. A modified version of the primary search strategy was used to accommodate the requirements of the different databases.

Participant or population Older adults aged 65 years and more with Alzheimer or Dementia.

Intervention Strength training programs and other training protocols with a minimum duration of 8 weeks intervention.

Comparator Other training protocols.

Study designs to be included Randomized controlled trials and meta-analysis.

Eligibility criteria Inclusion criteria: (i) Senior adults over 65, men and women; (ii) Stregth training with machines, free weigths (dumbbells and barbells), aerobic training indoor with ergometers; (iii) improvements in cognition, memory and daily life activities; (iv) minimum duration of 8 weeks intervention; (v) Randomized controlled trials and meta-analysis, original studies, written in English.
Exclusion criteria: (i) People under 65 who takes statins and antidepressants, poor sample; (ii) training with body weight, outdoor training, unsupervised training; (iii) Less then 8 weeks intervention; (iv) Non-randomized studies, case reports, cross-sectional, retrospective studies, observational studies. Conference abstracts, books chapters, published in non-peer reviewed journals, websites, and preprint editions, non human studies; (v) Written in other language than English.

Information sources Electronic databases (Cochrane, PubMed, Scopus, Web of Science and SPORTDiscus), were searched for relevant publications.

Main outcome(s) The improvement in cognition was chosen as the main outcome.

Additional outcome(s) Improvement in daily life activities (independence and autonomy).

Data management The zotero software (version 7.0.11) was utilized to compile and organize studies obtained from the various databases.

Quality assessment / Risk of bias analysis The Physiotherapy Evidence Database (PEDro) scale was used to assess the methodological quality of the randomized controlled trials included in this systematic review and meta-analysis. The scale scores the internal study validity in a range of 0 (low methodological quality) to 10 (high methodological quality). Eleven items are measured in the scale. The criterion 1 is not included in the final score. Points for items 2 to 11 were only attributed when a criterion was clearly satisfied.
A comprehensive literature will be applied using electronic databases (Cochrane, Medline (PubMed), Scopus, Web of Science and SPORTDiscus) to identify relevant studies.

This review adhered to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to maintain transparency and methodological quality.

Strategy of data synthesis Data extracted from the included studies were synthesized both qualitatively and quantitatively. For the qualitative synthesis, a narrative comparison of results was conducted, considering differences in training protocols, sample characteristics, cognitive and functional assessment tools.
If possible, a Meta analysis will be performed using random-effects models to calculate the effect size (Hedges' g) of strength training interventions compared to other training protocols (e.g., aerobic, functional, or multimodal training).

Subgroup analysis A subgroup will not be considered.

Sensitivity analysis In the randomized control trials studies, we will use the PEDro scale.

Language restriction English.

Country(ies) involved Portugal.

Keywords Strength training, other training protocols, Alzheimer, Dementia, cognition, daily life activities, exercise.

Contributions of each author
Author 1 - António Mendes Braz - Lead the project, wrote and revised the original manuscript and analyzed and interpreted the data, wrote the statistical report and revised the original manuscript.
Email: antoniomendesbraz@gmail.com
Author 2 - Paulo Malico Sousa - Run the data search, performed the methodological assessment, conducted the data extraction, wrote and revised the original manuscript.
Author 3 - Valter Pinheiro - Run the data search, performed the methodological assessment, conducted the data extraction, wrote and revised the original manuscript.
Author 4 - Armando Costa - Run the data search, performed the methodological assessment, conducted the data extraction, wrote and revised the original manuscript.
Email: acosta_isce@hotmail.com
Author 5 - Raynier Montoro - Run the data search, performed the methodological assessment, conducted the data extraction, wrote and revised the original manuscript.
Email: rayniermb@gmail.com