

Abstract

Clinical Applicability of Physical Exercise in Alzheimer's Disease and Mild Cognitive Impairment: A Secondary Analysis of Systematic Reviews [†]

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[†] Presented at the 6th International Congress on Health Innovation—INOVATEC 2025, Hybrid, 21–23 November 2025.

Keywords: Alzheimer's disease; mild cognitive impairment; physical exercise

Introduction: Alzheimer's disease (AD) and mild cognitive impairment (MCI) are major causes of cognitive decline, often accompanied by sleep disturbances and amyloid- β ($A\beta$) deposition. Pharmacological options remain limited, reinforcing interest in physical exercise as a non-pharmacological therapy. **Methods:** We performed a secondary analysis of four systematic reviews, based on PubMed/MEDLINE, Embase, Scopus, Web of Science, and Cochrane, to integrate evidence on cognition, sleep, and biomarkers. **Results:** The reviews synthesised 42 randomised controlled trials (RCTs): 16 on cognition in AD, 17 on cognition in MCI, 4 on sleep in MCI, and 5 on $A\beta$ biomarkers in AD. Interventions included aerobic, resistance, multicomponent, Tai Chi, and dance protocols. Most of the 16 AD trials and 17 MCI trials reported cognitive gains, particularly in executive function and memory. The four sleep-focused studies in MCI showed consistent improvements in sleep quality, with two identifying this as a mediator of cognitive benefits. Of the five biomarker trials in AD, three suggested $A\beta$ reduction, while two found no change but still observed cognitive improvements. Tai Chi and dance reported high adherence and psychosocial benefits, while community programmes such as FINGER and Vivifrail confirmed feasibility in practice. **Conclusions:** This collective synthesis reinforces physical exercise as a clinically applicable, safe, and cost-effective strategy for AD and MCI management. Its integration into multidisciplinary care may delay decline, enhance sleep, and improve quality of life, though further standardised and long-term trials are required.



Academic Editors: Andreanne Vasconcelos, Amílcar Damazo and José Roberto Leite

Published: 26 February 2026

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Author Contributions: Conceptualization, R.L.O. and C.G.; methodology, R.L.O. and C.G.; validation, R.L.O. and C.G.; formal analysis, R.L.O.; investigation, R.L.O., E.F.F.S.V., J.B.H., L.R.A., M.L.S.C., K.L.A. and E.A.C.W.-F.; data curation, R.L.O., E.F.F.S.V., J.B.H., L.R.A., M.L.S.C., K.L.A. and E.A.C.W.-F.; writing—original draft preparation, R.L.O.; writing—review and editing, R.L.O., C.G. and E.A.C.W.-F.; visualization, R.L.O.; supervision, R.L.O. and C.G.; project administration, R.L.O.; funding acquisition, R.L.O. All authors have read and agreed to the published version of the manuscript.

Funding: This research was supported by the Research Support Foundation of the Federal District (FAPDF), Brazil, and the National Council for Scientific and Technological Development (CNPq), Brazil, through research scholarships.

Institutional Review Board Statement: Ethical review and approval were waived for this study because it used only publicly available published data and did not involve human or animal subjects.

Informed Consent Statement: Patient consent was waived because this study is a secondary analysis of previously published data and did not involve direct participation of human subjects.

Data Availability Statement: No new data were created or analysed in this study.

Conflicts of Interest: The authors declare no conflict of interest.

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