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Effects of Baduanjin exercise on cognitive impairment in older adults: a systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

Support - No Support.

Review Stage at time of this submission - Piloting of the study selection process.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 03 June 2024 and was last updated on 03 June 2024.

INTRODUCTION

Review question / Objective The objective of this systematic review and meta-analysis is to evaluate the feasibility and effectiveness of Baduanjin exercise in mitigating cognitive impairment among older adults.

Condition being studied Cognitive impairment in older adults has become a significant public health concern due to its impact on quality of life and increasing prevalence with aging populations. Traditional mind-body exercises, such as Baduanjin, have gained attention for their potential benefits in managing cognitive decline. Baduanjin, a form of mind-body exercise, is characterized by gentle movements, meditation, and controlled breathing, which may promote cognitive health and overall well-being in older adults. However, the general efficacy of Baduanjin exercise for alleviating cognitive impairment in this demographic remains unclear. The aim of this systematic review and meta-analysis is to evaluate the feasibility and effectiveness of Baduanjin exercise in mitigating cognitive impairment among older adults.

METHODS

Search strategy The following electronic bibliographic databases will be searched to identify relevant studies: PubMed, Embase, Cochrane Library, Web of Science, the Chinese Science and Technique Journals Database, China National Knowledge Internet, and the Wanfang Data information site. In addition, clinical trial registries, such as ClinicalTrials.gov, will also be searched for ongoing trials with unpublished data. The search period will be recorded for each database. A combination of subject words and free text words will be applied in the searches.
In addition, a manual search will also be carried out to supplement the electronic searches, and the references of relevant studies will be investigated for any further material for inclusion. Terms and electronic databases included in the review.

Participant or population The participants in this review will include older adults aged 60 years and above who have been diagnosed with cognitive impairment. Cognitive impairment may include conditions such as mild cognitive impairment (MCI) and various forms of dementia.

Intervention The intervention method of the experimental group is Baduanjin exercise, which has no restriction on types or training periods.

Comparator All comparator/control groups are eligible.

Study designs to be included Only randomized controlled trials (RCTs) were considered eligible.

Eligibility criteria Eligibility criteria were detailed using the Participants, Interventions, Controls, Outcomes, and Studies (PICOS) framework.
Inclusion criteria:
(1) Studies involving older adults (aged 60 years and above) diagnosed with cognitive impairment.
(2) Studies must have examined Baduanjin exercise as the only intervention.
(3) Studies with a control group receiving no intervention, usual care, or other therapy.
(4) Studies reporting on cognition-related outcomes.
(5) The study design was a randomized controlled trial (RCT).

Exclusion criteria:
(1) The cognitive impairment of the subjects was not clear.
(2) Studies involving participants with severe mental or physical conditions that could interfere with the intervention or outcomes assessment.
(3) Studies in which Baduanjin exercise combined with other interventions, such that the individual effects of Baduanjin exercise cannot be assessed.
(4) Incomplete or missing outcome indicators.
(5) Case reports, case series, review articles, and qualitative studies.

Information sources The following electronic bibliographic databases will be searched to identify relevant studies: PubMed, Embase, Cochrane Library, Web of Science, the Chinese Science and Technique Journals Database, China National Knowledge Internet, and the Wanfang Data information site. In addition, clinical trial registries, such as ClinicalTrials.gov, will also be searched for ongoing trials with unpublished data.

Main outcome(s) The primary outcomes include cognition-related results, such as cognitive function (using tools like MMSE and MoCA), memory performance, attention and executive function, quality of life, and emotional well-being (assessed through GDS and HADS).

Additional outcome(s) Safety measurements and adverse events.

Data management Two reviewers will assess the eligibility of the studies retrieved during the searches independently against the inclusion and exclusion criteria, and those studies meeting the criteria will be selected for use in the review. The following data will then be extracted from the studies selected for inclusion using a data collection form, and recorded in an Excel file: first author and year, study design, sample, intervention, control group, type of measures, risk of bias assessment and findings. The results will be cross-checked by the two reviewers, and any disagreements will be resolved by consensus, with any ongoing differences in opinion being arbitrated by a third reviewer. We may also contact the original authors to provide additional relevant information, if necessary.

Quality assessment / Risk of bias analysis Two reviewers independently assessed the quality of each trial according to the Cochrane risk of bias tool, which contained 7 domains: random sequence generation, allocation concealment, blinding of participants and investigators, blindness of outcome assessments, incomplete outcome data, selective outcome reporting, and other biases. We will judge the each of the domains as 'low risk of bias', 'high risk of bias', or 'unclear risk of bias' according to Higgins (2011).Disagreements were rechecked by discussion with a third reviewer. We will illustrate the potential biases within each of the included studies by presenting a 'risk of bias' table or graph and summary.

Strategy of data synthesis Meta analysis was performed using RevMan 5.4 software provided by the Cochrane Collaboration. For continuous outcomes, data will be analyzed by using a standard mean difference (SMD) with 95% CIs or a weighted mean difference (WMD).The WMD will be used for the same scale or the same assessment instrument; SMD will be used for different assessment tools. If subsets of studies are sufficiently homogeneous, we will perform a meta-analysis to combine their results for our primary outcomes. Statistical heterogeneity will be assessing using a standard χ^2 test, with a significance level of $P<0.05$ regarded as significant, and the I^2 statistic will also be used. The fixed-effects model will be utilized if the

heterogeneity test indicates no significant difference ($I^2$0.1); otherwise, the random-effects model will be used.

Subgroup analysis Where possible, the analysis of sub-groups will explore the difference in the effectiveness of Baduanjin exercise for varying population groups, intervention length, and the type of intervention.

Sensitivity analysis Sensitivity analysis may be performed by removing low quality studies, or trials with a short-term follow-up.

Language restriction There are no restrictions on Languages.

Country(ies) involved China.

Keywords Baduanjin exercise; cognitive impairment; older adults; meta-analysis.

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