INPLASY

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From Dogs to Robots: Pet-Based Interventions for Depression in Older Adults — A Network Meta-Analysis of Randomized Controlled Trials

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ADMINISTRATIVE INFORMATION

Support - Wei Gong Memorial Hospital.

Review Stage at time of this submission - Data analysis.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2025100023

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

INTRODUCTION

Review question / Objective P: Adults ≥60 years with depression; I: Animal-assisted therapy ; C: Usual care, waitlist, or other non-animal activities; O: Change in depressive symptoms (primary); effect differences by modality and content (secondary).

Condition being studied Late-life depression in adults aged 60 years and older — a common but often underdiagnosed mood disorder characterized by persistent sadness, anhedonia, social withdrawal, and functional decline, frequently complicated by multimorbidity and cognitive impairment.

METHODS

Search strategy A systematic search will be conducted in major electronic databases (such as PubMed, Embase, Web of Science, and the Cochrane Library) using relevant keywords and subject terms related to pet-assisted interventions and late-life depression in older adults. Detailed search terms and strategies will be provided upon publication of the study.

Participant or population Older adults aged 60 years and above diagnosed with late-life depression, regardless of gender, ethnicity, or residential setting. Eligible participants are those enrolled in randomized controlled trials evaluating pet-assisted interventions for depressive symptoms.

Intervention Pet-based interventions, including but not limited to: Animal-assisted therapy involving live companion animals (e.g., dogs, cats, rabbits) Visits or activities with therapy animals in residential or clinical settings. Robotic pet interventions (e.g., PARO robotic seal, robot dogs/cats). Other forms of structured pet-facilitated activities designed to reduce depressive symptoms in older adults. Each intervention may vary in duration, frequency, setting (community, care home, hospital), and modality (individual or group).

Comparator Comparators may include: Usual care (standard care without pet intervention). Non-pet psychosocial interventions (e.g., recreational activities, cognitive training). Waitlist or no-intervention control groups. Alternative pet interventions (comparisons between different types of animal-assisted or robotic interventions). Indirect comparisons with all eligible control groups will be included according to the network meta-analysis framework.

Study designs to be included Randomized controlled trials (RCTs) only.

Eligibility criteria The inclusion criteria were randomized controlled trials (RCTs) evaluating pet-assisted interventions for late-life depression in adults aged 60 years or above. Studies had to report at least one validated depression outcome and be published in English. Exclusion criteria included non-randomized studies, observational studies, case reports, or reviews, as well as studies without a control or comparator group. Additionally, studies with a primary diagnosis other than depression or publications not in English were excluded.

Information sources The following four electronic databases will be used as information sources for this review: PubMed, Embase, Web of Science, Cochrane Library.

Main outcome(s) The primary outcome is change in depressive symptoms, measured by validated depression scales (such as the Geriatric Depression Scale, Hamilton Depression Rating Scale, Beck Depression Inventory, or other standardized instruments) at the end of the intervention period. Effect measures will include mean difference (MD) or standardized mean difference (SMD) between intervention and comparator groups.

Additional outcome(s) Secondary outcomes will include improvement in depression by intervention modality (single, combined, robotic) and intervention content (physical, cognitive-social, social-emotional, cognitive stimulation), analyzed by standardized mean difference at endpoint.

Quality assessment / Risk of bias analysis The methodological quality of included randomized controlled trials will be evaluated using the Cochrane Risk of Bias 2.0 tool. Two reviewers will independently assess the following domains: randomization process, deviations from intended interventions, missing outcome data, measurement of the outcome, and selection of the reported result. Discrepancies will be resolved by consensus or consultation with a third reviewer. Results of quality assessment will be presented in summary tables and incorporated into sensitivity analyses and grading of evidence.

Strategy of data synthesis A network meta-analysis will be performed to estimate the relative effects of interventions using SMD with 95% CI, enabling both direct and indirect comparisons. Random-effects models and standard NMA methodology will be applied.

Subgroup analysis Subgroup analysis is not applicable in this network meta-analysis protocol.

Sensitivity analysis Sensitivity analyses will be performed by excluding each study in turn (leave-one-out approach) to examine the robustness of the findings.

Country(ies) involved Taiwan.

Keywords animal-assisted therapy; robotic pets; late-life depression; network meta-analysis; older adults.

Contributions of each author
Author 1 - Berne Ting.
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