

Efficacy of Different Acupuncture Methods in Treating Cancer-Induced Fatigue: A Network Meta-Analysis

INPLASY202680021

doi: 10.37766/inplasy2026.8.0021

Received: 4 August 2026

Published: 5 August 2026

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ADMINISTRATIVE INFORMATION**Support** - Guangdong Provincial Hospital of Chinese Medicine Scientific Research Program (YN2023HL07, YN2024HL17).**Review Stage at time of this submission** - The review has not yet started.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202680021**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 5 August 2026 and was last updated on 5 August 2026.**INTRODUCTION**

Review question / Objective To compare the effectiveness of different caregiver competence enhancement interventions for informal caregivers of disabled older adults through a systematic review and network meta-analysis, and to rank these interventions to identify the most effective approaches.

Rationale With the accelerated global aging process, the number of disabled older adults is increasing rapidly. Informal caregivers—family members, relatives, or friends who provide unpaid care—play a vital role in the long-term care of disabled older adults. However, these caregivers often lack professional caregiving knowledge and skills, which may compromise care quality and negatively impact both caregivers' and care recipients' well-being. Although various interventions (e.g., educational programs, psychological support, comprehensive training models) have been developed to enhance caregiver competence, their comparative

effectiveness remains unclear. No network meta-analysis has systematically compared and ranked these interventions. Therefore, this study aims to synthesize available evidence through a network meta-analysis to inform evidence-based practice and policy-making.

Condition being studied Disability in older adults, defined as limitations in activities of daily living (ADLs) or instrumental activities of daily living (IADLs) due to physical, cognitive, or sensory impairments. This study focuses on the informal caregivers of this population and the interventions designed to enhance their caregiving competence.

METHODS

Search strategy A combination of MeSH terms and free-text words will be used. Chinese search terms include: "失能/功能障碍/活动受限/残障", "老人/老年人/高龄", "照顾者/照护者/照料者/家属/亲属". English search terms include: "disabled person/people with disabilities/physically disabled/

disabilit/handicapped", "aged/elderly", "caregiver/carer/family caregivers/spouse caregivers/informal caregivers". The following databases will be searched from inception to May 30, 2025: CNKI, Wanfang, VIP, SinoMed, PubMed, Web of Science, Cochrane Library, Embase, Proquest, and Medline. Taking PubMed as an example, the search strategy is: ("disabled persons"[Mesh] OR "people with disabilities"[Ti/Ab] OR "physically disabled"[Ti/Ab] OR "handicapped"[Ti/Ab] OR "disabilit"[Ti/Ab]) AND ("aged"[Mesh] OR "elderly"[Ti/Ab]) AND ("caregivers"[Mesh] OR "carer"[Ti/Ab] OR "family caregivers"[Ti/Ab] OR "spouse caregivers"[Ti/Ab] OR "informal caregivers"[Ti/Ab]).

Participant or population Informal caregivers of disabled older adults—defined as family members, relatives, or friends who provide unpaid care and have not received professional caregiving training, and who have a kinship or social relationship with the care recipient. No restrictions will be applied regarding the caregiver's age, gender, or duration of caregiving.

Intervention Any intervention designed to enhance the caregiving competence of informal caregivers of disabled older adults. These may include but are not limited to: (1) educational interventions (e.g., caregiving knowledge and skills training); (2) psychological support programs (e.g., counseling, stress management, peer support); (3) comprehensive training models combining education and psychological support; and (4) other multicomponent interventions.

Comparator Usual care, no intervention, wait-list control, or alternative active interventions (e.g., comparison between different types of caregiver competence enhancement interventions).

Study designs to be included Randomized controlled trial.

Eligibility criteria Inclusion criteria: (1) Participants (P): informal caregivers of disabled older adults; (2) Concept (C): studies focusing on enhancing or assessing caregiver competence; (3) Context (C): caregiving occurs in home, community, or institutional settings; (4) Study design: randomized controlled trials, quasi-experimental studies, or mixed-methods studies. Exclusion criteria: (1) case reports, conference abstracts, reviews, dissertations, cross-sectional surveys, qualitative studies, commentaries, or policy documents; (2) studies on formal or paid caregivers (e.g., nursing home staff); (3) studies with incomplete data or unavailable full text; (4) non-Chinese or non-English publications; (5) duplicate publications.

Information sources The following electronic databases will be searched: CNKI, Wanfang, VIP, SinoMed, PubMed, Web of Science, Cochrane Library, Embase, Proquest, and Medline. Additional sources include manual screening of reference lists of included studies and relevant reviews.

Main outcome(s) Caregiver competence, assessed by validated scales. Commonly used instruments include the Caregiver Competence Scale, the Family Caregiver Task Inventory, and the Preparedness for Caregiving Scale, among others. Since different studies may employ different measurement tools, the standardized mean difference (SMD) with 95% confidence intervals will be used as the effect size for pooling outcomes across studies.

Additional outcome(s) (1) Caregiver burden (e.g., Zarit Burden Interview); (2) Caregiver psychological well-being (e.g., depression, anxiety, quality of life); (3) Care recipient outcomes (e.g., quality of life, behavioral and psychological symptoms); (4) Intervention adherence and satisfaction.

Data management Retrieved records will be imported into NoteExpress 4.1 software for duplicate removal. Two researchers will independently screen titles and abstracts based on the eligibility criteria, followed by full-text review for final inclusion. Data extraction will be performed independently by two researchers using a standardized data extraction form, with disagreements resolved through discussion with a third researcher. Extracted data will include: first author, publication year, country, study design, sample size, participant characteristics, intervention details (type, frequency, duration), comparator, outcome measures, and quality assessment results. Data will be managed using Microsoft Excel.

Quality assessment / Risk of bias analysis The methodological quality of included randomized controlled trials will be assessed using the Cochrane Risk of Bias Tool, covering the following domains: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective reporting, and other sources of bias. For quasi-experimental studies, the Risk of Bias in Non-randomized Studies of Interventions (ROBINS-I) tool will be used. Two researchers will independently perform the quality assessment, with disagreements resolved through discussion with a third researcher.

Strategy of data synthesis Direct pairwise meta-analyses will be conducted using RevMan 5.3 software. Since different studies may use different measurement scales for caregiver competence, the standardized mean difference (SMD) with 95% confidence intervals (CI) will be used as the effect size. Heterogeneity will be assessed using the I^2 statistic and corresponding P value. When $I^2 \geq 50\%$ and $P \leq 0.05$, significant heterogeneity will be considered, and a random-effects model will be applied; otherwise, a fixed-effects model will be used. A two-tailed $P = 0.05$ will indicate no significant global inconsistency. Funnel plots will be used to assess potential publication bias.

Subgroup analysis If sufficient data are available, subgroup analyses will be conducted based on the following pre-specified factors: (1) intervention duration (short-term vs. long-term); (2) intervention delivery format (individual vs. group vs. mixed); (3) caregiver characteristics (e.g., spouse vs. adult children caregivers); (4) care setting (home vs. community vs. institutional).

Sensitivity analysis Sensitivity analyses will be performed to test the robustness of the results by: (1) excluding studies with high risk of bias; (2) excluding quasi-experimental studies and including only randomized controlled trials; (3) using different effect models (fixed-effect vs. random-effects); (4) excluding studies with small sample sizes.

Language restriction Chinese/english.

Country(ies) involved China.

Keywords disabled older adults; informal caregivers; caregiver competence; network meta-analysis; systematic review.

Contributions of each author

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