INPLASY

INPLASY202510034

doi: 10.37766/inplasy2025.1.0034

Received: 10 January 2025

Published: 10 January 2025

Trend analysis of acupuncture intervention in chronic pain based on Citespace

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ADMINISTRATIVE INFORMATION

Support - Self-raised.

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202510034

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 10 January 2025 and was last updated on 10 January 2025.

INTRODUCTION

Review question / Objective P (Population): Adults suffering from chronic pain. I (Interventions): Various forms of acupuncture therapies, including manual acupuncture, electroacupuncture, moxibustion, and other related techniques. C (Comparators): Other treatment modalities such as pharmacotherapy, physical therapy, placebo interventions, or comparisons among different acupuncture methods. O (Outcomes): Changes in pain intensity, functional improvement, enhancement in quality of life, and other relevant clinical outcomes. S (Study Design): Randomized controlled trials (RCTs) or other high-quality clinical studies.

Rationale Chronic pain is a prevalent condition that significantly impairs quality of life and poses challenges in management. Acupuncture, a key component of traditional Chinese medicine, has been increasingly utilized as a non-pharmacological intervention for chronic pain relief. Despite its widespread use, the efficacy of acupuncture remains a topic of debate within the medical community.

Previous individual patient data meta-analyses have indicated that acupuncture is superior to both sham and no-acupuncture controls across various chronic pain conditions, including back and neck pain, osteoarthritis, and chronic headaches. These studies suggest that acupuncture provides modest but statistically significant benefits in pain reduction and functional improvement. JPain

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However, the heterogeneity in acupuncture modalities—such as manual acupuncture, electroacupuncture, and moxibustion—necessitates a comprehensive comparison to identify the most effective approaches. Network meta-analysis (NMA) offers a robust statistical framework to compare multiple interventions simultaneously, even when direct head-to-head trials are lacking. By integrating direct and indirect evidence, NMA can rank the relative efficacy of different acupuncture techniques for chronic pain management.

Condition being studied Chronic pain is a persistent or recurring pain lasting over three months, often associated with conditions like arthritis, neuropathy, headaches, or fibromyalgia. It significantly affects individuals' physical, emotional, and social well-being, leading to disability and reduced quality of life. Managing chronic pain is challenging due to its complex nature and varied responses to treatments.
Acupuncture, a traditional Chinese medicine technique, is increasingly used as a complementary therapy. This study evaluates the effectiveness of various acupuncture modalities for chronic pain through a network meta-analysis to identify the most effective strategies for pain relief and improved quality of life.

METHODS

Search strategy

Databases to Search
PubMed
Cochrane Library
Web of Science
Embase
CNKI (for Chinese studies)
ClinicalTrials.gov (for unpublished trials)

Search Terms

Population: "chronic pain," "persistent pain," "long-term pain"

Interventions: "acupuncture," "electroacupuncture," "manual acupuncture," "moxibustion"

Comparisons: "placebo," "sham acupuncture," "conventional therapy," "pharmacological treatment"

Outcomes: "pain relief," "pain intensity," "quality of life," "functional improvement"

Study Design: "randomized controlled trials," "RCTs," "clinical trials".

Participant or population The population of interest in this study includes adults diagnosed with chronic pain conditions lasting more than three months. These conditions may include, but are not limited to:

Chronic low back pain

Osteoarthritis

Fibromyalgia

Neuropathic pain (e.g., diabetic neuropathy, postherpetic neuralgia)

Chronic tension-type headaches or migraines

Cancer-related pain.

Intervention The intervention under investigation includes various forms of acupuncture used to manage chronic pain. These may include, but are not limited to:

Manual acupuncture: Traditional needle insertion and manipulation at specific acupoints.

Electroacupuncture: Needle insertion combined with electrical stimulation.

Moxibustion: The burning of mugwort near or on the skin to stimulate acupoints.

Auricular acupuncture: Acupuncture applied to specific points on the ear.

Combined acupuncture therapies: A combination of acupuncture and other modalities, such as cupping or herbal medicine.

Comparator The comparators in this study include the following:
Placebo or Sham Acupuncture:
Use of non-penetrating needles or needle insertion at non-acupuncture points to mimic the procedure without therapeutic intent.
Conventional Treatments:
Standard medical treatments such as pharmacological therapies (e.g., NSAIDs, opioids), physical therapy, or other commonly used pain management methods.
No Treatment or Usual Care:
Patients receiving routine care without specific pain interventions.
Other Acupuncture Modalities:
Comparisons between different forms of acupuncture, such as manual acupuncture vs. electroacupuncture or moxibustion vs. auricular acupuncture.

Study designs to be included This study will include the following designs to ensure the inclusion of high-quality evidence:Randomized Controlled Trials (RCTs):The primary study design, as RCTs are considered the gold standard for assessing the efficacy of interventions and minimizing bias.Cluster-Randomized Trials:Where randomization occurs at the group or cluster level, provided the intervention and outcomes are clearly reported.Crossover Trials:Studies where

participants receive multiple interventions in a randomized order, provided there is sufficient data for extraction and analysis.

Eligibility criteria Population:

Adults (≥18 years old) diagnosed with chronic pain lasting more than three months, regardless of the underlying cause (e.g., low back pain, fibromyalgia, osteoarthritis, neuropathic pain).

Interventions:

Studies evaluating any form of acupuncture, including manual acupuncture, electroacupuncture, moxibustion, auricular acupuncture, or combined acupuncture therapies.

Comparators:
Placebo or sham acupuncture.
Conventional treatments (e.g., pharmacological therapy, physical therapy).
No treatment or usual care.
Other acupuncture modalities.

Outcomes:
At least one of the following:Pain intensity reduction.
Improvement in physical function.
Quality of life enhancement.
Other clinically relevant outcomes related to chronic pain management.

Study Design:
Randomized controlled trials (RCTs), including cluster-randomized and crossover trials.

Language:
Studies published in English or Chinese.

Publication Year:
Studies published within the last 10 years to ensure up-to-date evidence.

Information sources To ensure a comprehensive and systematic search for relevant studies, the following information sources will be utilized:

1. Electronic Databases
PubMed
Cochrane Library
Web of Science
Embase
CNKI (China National Knowledge Infrastructure)
ClinicalTrials.gov (for unpublished and ongoing clinical trials).

Main outcome(s) The main outcomes of interest for this study are:
Pain Intensity Reduction:

Assessed using standardized scales, such as the Visual Analog Scale (VAS), Numeric Rating Scale (NRS), or similar validated measures.

Functional Improvement:

Evaluated through patient-reported outcomes or standardized tools, such as the Oswestry Disability Index (ODI) or Roland-Morris Disability Questionnaire (RMDQ), depending on the type of chronic pain.

Quality of Life Enhancement:

Measured using instruments like the Short Form Health Survey (SF-36), EQ-5D, or other relevant quality-of-life scales.

Quality assessment / Risk of bias analysis 1. Tools for Assessment
To ensure the reliability and validity of the network meta-analysis, the following tools will be employed:
Cochrane Collaboration's Risk of Bias Tool (RoB 2): For assessing randomized controlled trials (RCTs), focusing on selection, reporting, and performance bias.
ROBINS-I (Risk of Bias in Non-randomized Studies of Interventions): For non-randomized intervention studies.
GRADE (Grading of Recommendations, Assessment, Development, and Evaluation): To evaluate the overall quality of evidence and strength of recommendations.
AMSTAR 2 (A Measurement Tool to Assess Systematic Reviews): For evaluating the methodological quality of systematic reviews included in the study.
2. Assessment Domains
The quality and risk of bias will be evaluated across the following dimensions:
Selection Bias: Adequacy of random sequence generation and allocation concealment.
Performance Bias: Blinding of participants and personnel to the intervention.
Detection Bias: Blinding of outcome assessment to minimize measurement errors.
Attrition Bias: Completeness of outcome data, addressing loss to follow-up and exclusions.
Reporting Bias: Potential selective reporting of outcomes.
Other Bias: Consideration of conflicts of interest, funding sources, or insufficient sample sizes.
3. Assessment Process

Two independent reviewers will conduct the quality assessment for each included study using the specified tools.
Discrepancies between reviewers will be resolved through discussion or adjudicated by a third reviewer.
The findings will be visually presented using Risk of Bias Graphs and Risk of Bias Summaries, as recommended by the Cochrane Handbook.
4. Handling of Results
Low risk of bias studies: Included in the primary network meta-analysis.
Moderate risk of bias studies: Analyzed in sensitivity analysis to evaluate their impact on conclusions.
High risk of bias studies: Excluded from the primary analysis or separately analyzed.

Strategy of data synthesis The Cochrane Risk of Bias Tool (RoB 2) will be used for randomized controlled trials (RCTs). The tool assesses the following domains:

Bias arising from the randomization process

Bias due to deviations from intended interventions

Bias due to missing outcome data

Bias in measurement of the outcome

Bias in selection of the reported result

Each domain will be rated as low risk, some concerns, or high risk of bias. An overall risk of bias judgment will be made for each study.

Subgroup analysis Pain Type: Low back pain, osteoarthritis, neuropathic pain, fibromyalgia, chronic headache.

Acupuncture Modality: Manual acupuncture, electroacupuncture, moxibustion, auricular acupuncture.

Pain Duration: 3–12 months vs. >12 months.

Comparators: Sham/placebo, conventional treatments, no treatment.

Treatment Protocol: Number of sessions (12) and duration (8 weeks).

Region: Asia, Europe, North America.

Patient Characteristics: Age (<50, ≥50) and gender.

Study Quality: Low vs. high risk of bias.

Sensitivity analysis Exclusion of High-Risk Studies:

Reanalyzing data by excluding studies with a high risk of bias.

Alternative Statistical Models:

Comparing results using fixed-effects and random-effects models.

Influential Studies:

Identifying and excluding studies with extreme effect sizes to evaluate their impact on the overall results.

Outcome Definition:

Testing results using different measurement scales for pain intensity or quality of life.

Publication Year:

Limiting analyses to studies published in the last five years to assess the impact of recent evidence.

Language restriction Chinese or English.

Country(ies) involved Malaysia , China.

Keywords Chronic PainAcupuncture Electroacupuncture MoxibustionManual Acupuncture Auricular AcupuncturePain Management Randomized Controlled Trials (RCTs) Network Meta-Analysis Pain Intensity Quality.

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