

Beyond the Bedside: A Systematic Review of Randomized Controlled Trials on Nursing Roles in Complementary and Alternative Medicine

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Abstract

Background: Complementary and Alternative Medicine (CAM) is increasingly integrated into healthcare to manage symptoms and improve well-being in cancer patients. Nurses, with their holistic approach, are key in delivering these therapies. A synthesis of evidence on nurses' roles, the CAM interventions they provide, and patient outcomes is needed. **Objectives:** This systematic review aimed to synthesize evidence from Randomized Controlled Trial (RCTs) on the roles of nurses in delivering CAM, the types of interventions used, target populations, and clinical outcomes achieved. **Methods:** A systematic search of major databases (PubMed/MEDLINE, Scopus, CINAHL, Web of Science) was conducted for RCTs investigating nurse-delivered CAM interventions with measurable patient outcomes. **Results:** Analysis of 95 RCTs showed that nurses primarily delivered CAM as direct practitioners (73.7% of studies). The most common interventions were mindfulness and massage, each reported in 23.2% of studies. Key target populations included oncology patients (24.2% of studies) and geriatric patients (18.9% of studies). Regarding clinical outcomes, pain reduction was the most frequently reported significant finding (40% of studies), followed by decreased anxiety (32.6% of studies), decreased depression (24.2% of studies), and improved sleep (18.9% of studies). Secondary benefits reported included reduced fatigue, gastrointestinal/respiratory symptoms, opioid use, and hospital stays. **Conclusion:** This review confirms that nurses are central providers of evidence-based CAM, delivering a wide range of therapies that significantly improve physical and psychological outcomes across diverse clinical settings. The findings support the formal integration of CAM training into nursing education and the creation of nurse-led CAM services to enhance holistic, patient-centered care.

Keywords: Complementary Therapies, Randomized Controlled Trial, Integrative Medicine, Nurse's Role, Cancer

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Introduction

Complementary and Alternative Medicine (CAM) has emerged as a significant component of contemporary healthcare, offering non-pharmacological approaches to symptom management, rehabilitation, and overall well-being [1, 2]. As healthcare systems increasingly emphasize patient-centered and holistic care, the integration of evidence-based CAM therapies into clinical practice has gained substantial momentum [3].

Among healthcare professionals, nurses are uniquely

positioned at the forefront of this integration [4]. Their continuous and direct patient contact places them in a central role to assess patient needs, administer CAM interventions, and evaluate their outcomes as part of comprehensive nursing care [5, 6]. The scope of nursing involvement in CAM is remarkably diverse, encompassing direct delivery of therapies such as massage and aromatherapy, patient education, care coordination, and support for mind-body practices [7]. This expanding role

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positions nurses as autonomous practitioners providing independent, therapeutic interventions that address the biopsychosocial dimensions of health [8, 9].

To date, systematic reviews in this field have largely focused on specific CAM modalities or particular patient populations. What remains less explored is a comprehensive synthesis that maps the full spectrum of nursing roles across different interventions and clinical contexts. In particular, no systematic review has yet synthesized evidence exclusively from randomized controlled trials to quantify the distribution of nursing roles, identify the most commonly delivered interventions, and aggregate patient outcomes across diverse settings [10, 11]. Understanding these patterns is essential for standardizing practice, guiding nursing education, and informing healthcare policy [12].

Therefore, this systematic review aimed to synthesize evidence from Randomized Controlled Trials (RCTs) on the roles of nurses in delivering CAM, the types of interventions used, target populations, and clinical outcomes achieved.

Objective

This systematic review aimed to synthesize evidence from RCTs to: (1) identify and categorize the roles nurses perform in the delivery of CAM therapies; (2) describe the types of CAM interventions most frequently administered by nurses; (3) examine the primary patient populations and clinical settings involved; and (4) evaluate the reported patient outcomes associated with nurse-delivered CAM.

Materials and Methods

This study employed a systematic review methodology to synthesize evidence from randomized controlled trials on nurses' roles in delivering CAM interventions. A systematic review was chosen as the most appropriate design to comprehensively identify, appraise, and synthesize quantitative evidence from RCTs in this field [13]. The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [14]. The primary research question guiding this review was: "What are the roles, involvement levels, and clinical outcomes associated with nurse-led or nurse-administered Complementary and Alternative Medicine interventions across diverse patient populations and settings?"

Search strategy

A comprehensive and systematic search strategy was developed in collaboration with a medical information specialist. The search was executed across four major electronic databases: PubMed/MEDLINE, Scopus, CINAHL (Cumulative Index to Nursing and Allied Health Literature), and Web of Science Core Collection. The search strategy combined controlled vocabulary (e.g., MeSH terms) and keywords related to three core concepts (Table 1).

To ensure the inclusion of contemporary, actionable evidence, the search was limited to studies published in

English between January 2015 and December 2025. This ten-year time frame was selected to capture the most recent developments and trends in nurse-led CAM research while maintaining methodological rigor. Furthermore, the reference lists of all included articles were manually screened (backward citation tracking) to identify additional relevant publications that might not have been captured by the initial database search.

All retrieved records were imported into EndNote 20 reference management software for initial deduplication and library organization. Subsequently, the unique records were transferred to Covidence systematic review software for the formal screening process. The study selection involved two distinct phases, performed independently by two reviewers: Phase 1 (Title/Abstract Screening): Records were screened against pre-defined eligibility criteria. Phase 2 (Full-Text Screening): The full texts of potentially relevant articles were retrieved and assessed in detail. Any disagreements between reviewers were resolved through discussion or by consultation with a third reviewer (Figure 1).

Eligibility criteria

- Population: Patients of any age or clinical condition (e.g., oncology, cardiology, critical care, psychiatry).
- Intervention: Any structured CAM therapy (e.g., mind-body interventions, manipulative practices, energy therapies) where a nurse had an explicit or clearly implied role in its design, delivery, coordination, or education.
- Comparator: Any control condition (e.g., standard care, placebo, another therapy).
- Outcomes: Any patient-reported or clinically measured outcome (e.g., symptom reduction, quality of life, physiological markers).
- Study Design: This systematic review included only RCTs to ensure a high level of evidence and methodological homogeneity in the synthesis. Initially, a broader range of study designs was considered; however, to maintain scientific rigor and align with the objectives of a systematic review of interventions, the final inclusion was restricted to RCTs. Protocols, commentaries, reviews, qualitative studies, quasi-experimental studies, pilot studies, and observational studies were excluded.

Study screening

A standardized, pilot-tested data extraction form was developed in Microsoft Excel. Key data from each included study were extracted by one reviewer and verified by a second. The extracted data included: Bibliometric information: title, author(s), publication year, country. Study Characteristics: study design, clinical setting, and target population. Intervention Details: Specific CAM therapy, description. Nurse Role Variables: Explicit mention of nurse role (Yes/No), Role Description, Main Role Category (practitioner/therapist, educator/facilitator, coordinator/manager, researcher), Additional Role(s), and Involvement Level (direct, indirect). Key Findings: Primary and secondary outcomes relevant to the intervention's effectiveness.

Data extraction

Data extraction was performed independently by two reviewers using a standardized template. The extracted data were analyzed using both quantitative (descriptive statistics, e.g., frequencies, percentages) and qualitative (thematic analysis) methods. Results were synthesized to: Provide a descriptive overview of the volume, nature, and distribution of the research (years, countries, clinical fields). Map and categorize the spectrum of nursing roles and involvement levels across different CAM modalities. Summarize the main clinical outcomes associated with nurse-delivered CAM interventions. Identify gaps in the literature and areas for future research. The findings are presented narratively, supported by summary tables and figures to provide a clear visual synthesis of the evidence landscape.

To ensure the methodological robustness of the included studies, a formal quality appraisal was performed. Two reviewers independently evaluated each randomized controlled trial using the Cochrane Risk of Bias (RoB 2) tool, which is the standard instrument for assessing bias in RCTs. The tool assesses potential bias across five domains: randomization process, deviations

from intended interventions, missing outcome data, measurement of the outcome, and selection of the reported result. Any discrepancies between the reviewers' assessments were resolved through consensus discussion, with arbitration by a third reviewer when necessary [15].

Results

Characteristics of Included Studies

A total of 95 studies were included in this review, published between 2015 and 2025. The geographical distribution was wide, with the highest number of studies conducted in China (n=30, 31.6%), followed by Iran (n=13, 13.7%), Turkey (n=10, 10.5%), and the United States (n=9, 9.5%) (Figure 2).

Nurse Involvement in CAM Interventions

Nurses played a central and explicit role in delivering CAM therapies. In 87 studies (91.6%), the nurse's role was explicitly stated. The level of involvement was primarily direct (89.5%), meaning nurses actively administered the therapy. A smaller proportion involved indirect support (10.5%), such as coordination or education.

Table 1. Database and Search Strategy

Database	Search Terms
PubMed	("nurs* role*" [tiab] OR "nursing role*" [tiab] OR "nurses' role" [tiab] OR "nurse's role" [tiab] OR "Nurse's Role" [Mesh] OR "Professional Role" [Mesh] OR "nurs*" [tiab]) AND ("Complementary Therapies" [Mesh] OR "alternative medicine" [tiab] OR "CAM" [tiab] OR "integrative medicine" [tiab] OR "integrative health" [tiab] OR "complementary medicine" [tiab] OR "acupuncture" [tiab] OR "massage" [tiab] OR "meditation" [tiab] OR "mindfulness" [tiab] OR "herbal medicine" [tiab] OR "Aromatherapy" [tiab] OR "Music Therapy" [tiab] OR "Relaxation Therapy" [tiab] OR "Therapeutic Touch" [tiab] OR "Tai Ji" [tiab] OR "Yoga" [tiab]) AND ("randomized controlled trial" [pt] OR "controlled clinical trial" [pt] OR randomized [tiab] OR randomised [tiab] OR placebo [tiab] OR "clinical trial" [tiab] OR trial [ti] NOT (animals [mh] NOT humans [mh])) AND (2015:2025 [pdat])
Scopus	(TITLE-ABS-KEY ("nurs* role*" OR "nursing role*" OR "nurses' role" OR "nurse's role" OR nurs*)) AND (TITLE-ABS-KEY ("complementary therap*" OR "alternative medicine" OR "CAM" OR "integrative medicine" OR "integrative health" OR "complementary medicine" OR acupuncture OR massage OR meditation OR mindfulness OR "herbal medicine" OR aromatherapy OR "music therapy" OR "relaxation therap*" OR "therapeutic touch" OR "tai ji" OR yoga)) AND (TITLE-ABS-KEY (randomi?ed OR randomised OR placebo OR "clinical trial" OR trial))
Web of Sciences	(TI=((("nurs* role*" OR "nursing role*" OR "nurses' role" OR "nurse's role"))) OR AB=((("nurs* role*" OR "nursing role*" OR "nurses' role" OR "nurse's role"))) OR TS=(nurs*)) AND (TS=((("complementary therap*" OR "alternative medicine" OR "CAM" OR "integrative medicine" OR "integrative health" OR "complementary medicine" OR acupuncture OR massage OR meditation OR mindfulness OR "herbal medicine" OR aromatherapy OR "music therapy" OR "relaxation therap*" OR "therapeutic touch" OR "tai ji" OR yoga)) AND (TS=(randomi?ed OR randomised OR placebo OR "clinical trial" OR trial)) AND PY=(2015-2025) AND DT=(Article OR Proceedings Paper) NOT DT=(Meeting Abstract)
CINAHL	((TI ("nurs* role*" OR "nursing role*" OR "nurses' role" OR "nurse's role") OR AB ("nurs* role*" OR "nursing role*" OR "nurses' role" OR "nurse's role") OR SU ("Nurse's Role" OR "Professional Role") OR TI (nurs*) OR AB (nurs*))) AND ((SU ("Complementary Therapies") OR TI ("alternative medicine" OR "CAM" OR "integrative medicine" OR "integrative health" OR "complementary medicine" OR acupuncture OR massage OR meditation OR mindfulness OR "herbal medicine" OR aromatherapy OR "music therapy" OR "relaxation therap*" OR "therapeutic touch" OR "tai ji" OR yoga) OR AB ("alternative medicine" OR "CAM" OR "integrative medicine" OR "integrative health" OR "complementary medicine" OR acupuncture OR massage OR meditation OR mindfulness OR "herbal medicine" OR aromatherapy OR "music therapy" OR "relaxation therap*" OR "therapeutic touch" OR "tai ji" OR yoga))) AND ((PT "clinical trial" OR PT "randomized controlled trial" OR TI (randomi?ed OR randomised OR placebo OR "clinical trial" OR trial) OR AB (randomi?ed OR randomised OR placebo OR "clinical trial" OR trial))) AND PY 2015-2025

The primary roles of nurses were categorized as follows

- Practitioner/Interventionist: This was the dominant role, assigned in 70 studies (73.7%), where nurses were the primary providers of the CAM therapy.
- Educator/Facilitator: Nurses assumed this role in 15 studies (15.8%), focusing on guiding, teaching, or facilitating self-care practices.
- Coordinator/Manager: This role was evident in 12 studies (12.6%), involving the organization and management of the CAM intervention within the care pathway.
- Other roles included Researcher/Assessor (n=6), Care Provider (n=5), and Program Leader/Advisor (n=2). Many studies documented nurses fulfilling multiple complementary roles.

Type of CAM Therapies and Target Populations

The CAM interventions were diverse and could be grouped into several major categories, as detailed in Table 2. The most frequently evaluated interventions were Mindfulness & Meditation-based therapies (23.2%), Massage & Touch Therapies (23.2%), and Aromatherapy (13.7%). Therapies rooted in Traditional Chinese Medicine (TCM), including acupuncture, acupressure, and TCM nursing techniques, were also prominent (11.6%).

The studies targeted a wide range of clinical populations, with the most common being: Oncology Patients (24.2%), Geriatric Populations & Dementia (18.9%), Patients with Mental Health Conditions (11.6%), Cardiovascular and Surgical Patients (10.5%) and Women's Health and Perinatal Care (8.4%).

Clinical Outcomes and Efficacy

The synthesized outcomes demonstrate the significant impact of nurse-delivered CAM interventions across multiple domains of patient care. A substantial majority of studies reported statistically significant positive outcomes.

- Pain Management: 38 studies (40%) reported significant reductions in pain intensity across conditions including cancer, postoperative recovery, chronic musculoskeletal pain, and procedural pain.

- Psychological Well-being: Improvements in anxiety were reported in 31 studies (32.6%), and in depression in 23 studies (24.2%). Other benefits included enhanced emotion regulation, resilience, and post-traumatic growth.

- Sleep Quality: 18 studies (18.9%) found that CAM interventions, particularly music therapy, mindfulness, and aromatherapy, led to significant improvements in sleep parameters.

- Physical Symptoms & Function: Studies reported benefits such as reduced fatigue (n=10), improved respiratory function (n=7), alleviation of gastrointestinal symptoms like constipation and nausea (n=12), and enhanced physical mobility.

- Healthcare Utilization & Safety: Several studies noted favorable secondary outcomes, including reduced opioid consumption (n=5), shorter hospital or ICU stay (n=4), and decreased incidence of postoperative complications like delirium and pulmonary issues (n=5).

Synthesis of Key Findings

This review of 95 studies underscores the integral and expanding role of nurses in the delivery of CAM within conventional healthcare settings. The evidence is robust, predominantly from RCTs, and demonstrates that nurse-administered CAM interventions spanning

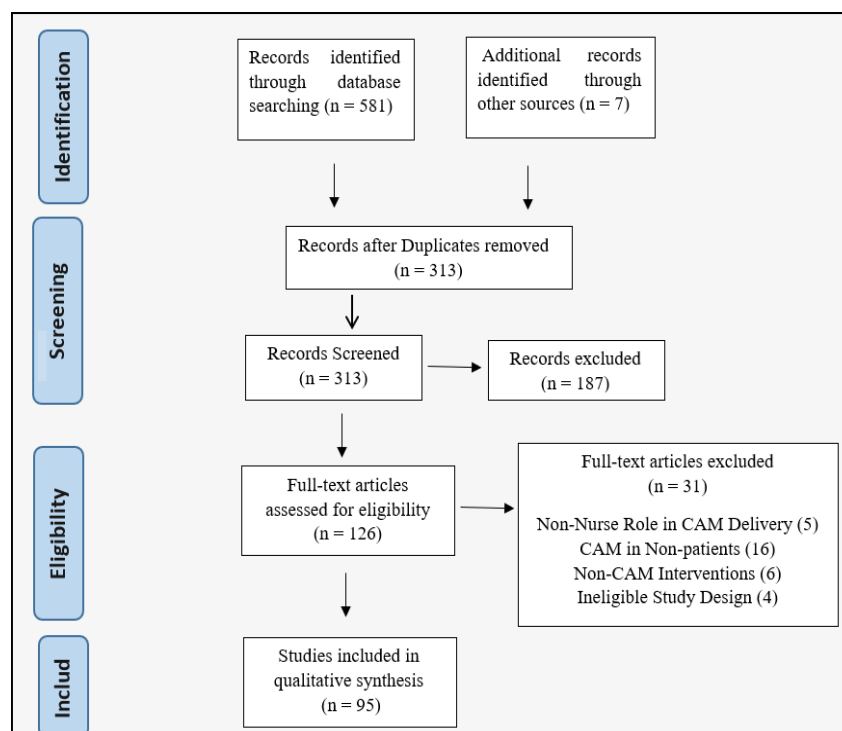


Figure 1. PRISMA Flow Diagram For Document Selection

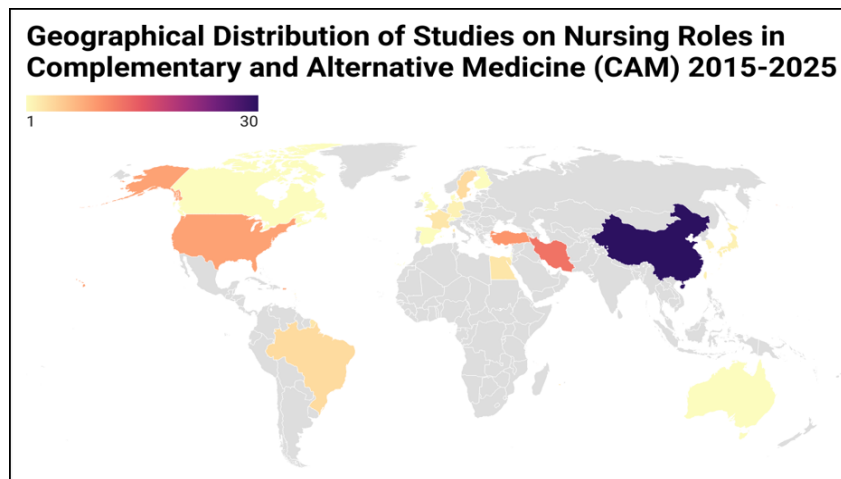


Figure 2. Geographical Distribution of Studies on Nursing Roles in CAM 2015- 2025

mind-body practices, tactile therapies, and traditional systems like TCM are feasible and effective. They yield clinically meaningful benefits across a biopsychosocial spectrum, most consistently in managing pain, psychological distress, and sleep disturbances in vulnerable populations such as oncology and geriatric patients. The primary model of delivery is direct, hands-on care by nurses acting as practitioners, which integrates these complementary approaches seamlessly into holistic patient-centered nursing practice.

Discussion

This systematic review synthesized evidence from 95 RCTs to elucidate the roles, interventions, and outcomes associated with nurse-delivered CAM across diverse clinical settings. Our findings confirm that nurses are not only active participants but often primary facilitators of evidence-based CAM therapies, contributing to improved patient outcomes through holistic, integrative care models.

The most frequently studied interventions were mindfulness/meditation and massage/touch therapies, each representing 23.2% of included RCTs. The prominence of mindfulness-based interventions reflects the growing recognition of mind-body medicine in nursing practice, particularly for managing psychological distress, pain, and stress-related conditions. Similarly, the high prevalence of massage and touch therapies underscores

the enduring value of tactile, human connection in nursing care addressing both physical symptoms and emotional needs. Aromatherapy (13.7%), music therapy (12.6%), and Traditional Chinese Medicine interventions (11.6%) formed a second tier of commonly studied modalities, demonstrating their versatility across perioperative, critical care, and oncology settings. Breathing exercises (8.4%) emerged as a simple yet effective intervention, particularly in pulmonary rehabilitation and anxiety management. The “Other Therapies” category (7.4%), though smaller, includes innovative modalities such as hypnotherapy, dance therapy, clown therapy, and equine therapy. While currently underrepresented in nursing literature, these approaches address psychosocial and emotional dimensions often overlooked in conventional care particularly in pediatric, geriatric, and psychiatric populations signaling an expanding horizon for CAM integration and areas ripe for future research.

The significant outcomes in pain management, anxiety, depression, and sleep quality corroborate a growing body of meta-analyses. For instance, our finding that mindfulness-based interventions reduced psychological distress mirrors results from a recent meta-analysis by Hui Liu et al [93]. on nurse-led mindfulness for chronic illness. Similarly, the efficacy of nurse-administered massage for pain reduction is consistent with the conclusions of Selene Mak et al [94]. The positive impact on fatigue [95], gastrointestinal symptoms [96], and respiratory function

Table 2. Distribution of CAM Therapies in Included Studies

Category of CAM Therapy	Number of Studies (n)	Percentage (%)	Example Interventions
Mindfulness & Meditation	22 [1, 2, 16–35]	23.20	Mindfulness-Based Stress Reduction, Mindfulness-Based Cognitive Therapy, Guided Imagery, Mindfulness-based Tai Chi
Massage & Touch Therapies	22 [7, 36–56]	23.20	Reflexology, Hand/Foot Massage, Abdominal Massage, Aromatherapy Massage
Aromatherapy	13 [18, 27, 38–40, 57–64]	13.70	Lavender oil inhalation, Peppermint oil application
Music Therapy	12 [11, 16, 31, 61, 65–72]	12.60	Personalized music, Receptive/Active music listening
Traditional Chinese Medicine	11 [6, 51, 73–81]	11.60	Acupuncture, Acupressure, Traditional Chinese Medicine, Ironing
Breathing Exercises	8 [4, 8, 49, 67, 69, 73–75]	8.40	Diaphragmatic breathing, Incentive spirometry training
Other Therapies	7 [52, 82–90]	7.40	Hypnotherapy, Dance Therapy, Clown Therapy, Equine Therapy

[97] further underscores the biopsychosocial utility of these interventions.

Geographically, the high volume of studies from China (31.6%) and Iran (13.7%) highlights the robust integration of Traditional Medicine principles into mainstream nursing practice there, a phenomenon less common in Western contexts. This disparity suggests that cultural acceptance and institutional support are critical facilitators for embedding CAM into nursing roles [99–101].

The direct involvement level (89.5%) signifies that CAM delivery is increasingly viewed as a core nursing competency rather than a peripheral referral activity. This finding is significant for global nursing practice as it: [1]. redefines the scope of nursing practice by positioning CAM as an integral component of everyday care, enhancing professional autonomy; [2]. necessitates systematic integration of CAM competencies into nursing curricula worldwide; [3]. informs healthcare policy by supporting investment in nurse-led CAM services; and [4]. offers an alternative model for Western healthcare systems, where CAM is often delivered by non-nurse practitioners. Beyond the practitioner role, nurses also served as educators, coordinators, and facilitators (28.4% collectively), bridging the gap between therapy administration and sustainable self-management [102].

These findings carry important implications for nursing practice, education, and policy. The consistent positive outcomes strongly support the formal integration of evidence-based CAM modalities into nursing curricula and continuing professional development [91, 92]. Nursing boards and healthcare institutions should consider developing certification pathways for specific CAM therapies (e.g., therapeutic massage, mindfulness facilitation) to ensure competency and standardization [93, 94]. For clinical practice, creating dedicated nurse-led CAM clinics or roles within hospitals particularly in oncology, palliative care, and mental health units could improve patient access and symptom management [95, 96]. Our findings also advocate for the inclusion of CAM interventions in clinical nursing guidelines for pain, anxiety, and insomnia [97, 98]. From a policy perspective, healthcare funders and insurers should recognize the cost-saving potential of nurse-delivered CAM, evidenced by reduced opioid use and shorter hospital stays in our findings, and consider mechanisms for reimbursement to incentivize its adoption [99, 100]. Future research should prioritize [1]: standardization and dose-response studies through high-quality RCTs comparing protocols and durations of common interventions; and [2] investigations into barriers and facilitators for nurses implementing CAM, including training needs, institutional culture, and interdisciplinary collaboration [101, 102].

Strengths and Limitations

A key strength of this review is its exclusive focus on RCTs, providing a high level of evidence for efficacy claims. The large sample (n=95) and wide geographical scope enhance the generalize ability of findings across different healthcare systems.

However, several limitations must be acknowledged.

First, the heterogeneity in specific CAM protocols, dosage, and intervention duration limits the ability to prescribe standardized practice guidelines. Second, potential for performance bias exists, as blinding of participants and nurses to interventions like massage or aromatherapy is often impossible. Third, this review was restricted to English-language publications. While many studies from non-English speaking countries are published in English, relevant RCTs published in other languages (e.g., Chinese, Persian, German, Spanish) may have been missed.

In conclusion, this review confirms the position of the nurse as an essential agent in the delivery of safe, effective, and patient-centered CAM. By using their unique therapeutic relationship with patients, nurses are successfully integrating complementary therapies into conventional care, addressing complex symptoms, and improving holistic well-being. Moving forward, strategic efforts in education, policy, and research are essential to fully realize this potential, ultimately leading to more integrative, compassionate, and effective healthcare systems worldwide.

Competing interests

The authors declare that they have no competing interests.

Abbreviations

Complementary and Alternative Medicine: CAM; Randomized Controlled Trial: RCT; Preferred Reporting Items for Systematic reviews and Meta-Analyses: PRISMA; Cumulative Index to Nursing and Allied Health Literature: CINAHL; Traditional Chinese Medicine: TCM.

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Availability of data and materials

The data used in this study are available from the corresponding author on request.

Ethics approval and consent to participate

None.

Consent for publication

By submitting this document, the authors declare their consent for the final accepted version of the manuscript to be considered for publication.

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Statement of Transparency and Principles

- The authors declare no conflict of interest.
- The study was approved by the Research Ethics Committee of the authors' affiliated institution.
- The study data are available upon reasonable request.
- All authors contributed to the implementation of this research.

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