Review Article

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The Effectiveness of Therapeutic Massage in Alleviating Chemotherapy-Induced Nausea and Vomiting: A Scoping Review

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Abstract

Background: Chemotherapy-Induced Nausea and Vomiting (CINV) is a challenging side effect for cancer patients, often impacting their well-being and adherence to treatment. While antiemetic medications are available, some patients continue to experience persistent symptoms. This has led to growing interest in complementary therapies like therapeutic massage to help manage CINV. This scoping review explores the potential of therapeutic massage in alleviating CINV, examines existing research, and highlights areas that require further study.

Methods: A systematic search was conducted in accordance with the Arksey and O'Malley framework and PRISMA-ScR guidelines across PubMed, Scopus, Embase, CINAHL, and the Cochrane Library for studies published from 2015 to 2024. Studies were eligible if they involved any type of cancer and chemotherapy regimen where therapeutic massage was administered as a supportive intervention for CINV. Notably, studies were not limited to those showing only positive effects; both supportive and non-supportive evidence were included to ensure an unbiased synthesis of available literature. Given heterogeneity in study designs, a narrative synthesis was employed to integrate findings across diverse methodologies and settings.

Results: A range of massage techniques-including Swedish massage, foot massage, abdominal massage, and slow-stroke back massage-were evaluated across different cancer types and treatment protocols. Several studies indicated reductions in nausea and vomiting severity, especially when massage was combined with complementary methods such as aromatherapy or music therapy. However, findings were mixed, and some studies reported no significant differences compared to control groups, emphasizing the need for standardized intervention protocols and improved methodological quality.

Conclusion: Therapeutic massage shows potential as an adjunctive intervention to alleviate CINV by enhancing relaxation and reducing psychological distress. However, further rigorous studies are required across diverse cancer types and chemotherapy protocols to confirm efficacy, optimize techniques, and integrate massage into routine cancer care.

Keywords: Antiemetics, Antineoplastic agents, Massage, Nausea, Vomiting

Introduction

For cancer patients receiving treatment, Chemotherapy-Induced Nausea and Vomiting (CINV) continues to be one of the most upsetting side effects, greatly affecting their quality of life and medication compliance (1,2).

Complementary therapies are necessary since a subgroup of patients still have breakthrough or refractory symptoms despite improvements in pharmaceutical antiemetics (3,4). Therapeutic massage has drawn interest among non-pharmacological approaches due to its possible ability to reduce CINV *via* psychological and physiological mechanisms (5,6). Massage is commonly administered to patients by trained healthcare providers, including licensed massage therapists or oncology nurses, within hospital or palliative care settings. In some cases, caregivers may be taught basic massage techniques under professional supervision, though the effectiveness may depend on the provider's skill level and patient comfort. This makes massage a practical option that can involve medical professionals, caregivers, or a combination of both, depending on the clinical context.

The advantages of therapeutic massage for cancer patients' pain management, anxiety reduction, and general well-being have been extensively established (7-9). Massage therapy is thought to improve gastrointestinal motility, lower stress levels, and modulate autonomic nervous system activity in order to affect CINV (10,11). According to studies, massage treatment increases parasympathetic activity, which may assist control pathways linked to nausea and promote patient comfort in general (12,13).

According to the literature currently available, complementary therapies including massage, acupuncture, and aromatherapy might considerably lessen the intensity of nausea and vomiting experienced by cancer patients undergoing chemotherapy (14,15).

Although the precise effects on CINV are yet unknown, a systematic review indicated that massage therapy was linked to better symptom management in cancer patients (16,17). Additionally, the effectiveness of massage in controlling nausea has been the subject of conflicting results from Randomized Controlled Trials (RCT); some have shown a decrease in the severity of symptoms, while others have found no discernible change when compared to standard care (18,19).

A scoping review is necessary to compile the body of knowledge regarding the efficacy of therapeutic massage in treating CINV, given the growing interest in integrative oncology and the demand for evidence-based alternative therapies. The purpose of this review is to examine previous research, pinpoint knowledge gaps, and offer insights into the possible mechanisms behind massage's therapeutic effects for chemotherapy patients (20).

A scoping review, rather than a meta-analysis or meta-synthesis, was selected since the available studies are highly heterogeneous in design, population, interventions, and outcome measures. This methodology is appropriate for mapping the breadth of literature, identifying key concepts and gaps, and laying the groundwork for future systematic reviews or clinical guidelines.

Materials and Methods

Study Design

The methodological approach described by Arksey and O'Malley (21) and the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) standards (22) are followed in the reporting of this scoping review. The purpose of the study is to compile the information currently available regarding therapeutic massage's efficacy in reducing CINV.

Eligibility criteria

According to the Population, Concept, and Context (PCC) framework, studies were chosen (23): Population: Patients suffering from nausea and/or vomiting during chemotherapy for cancer. The idea behind this intervention is the use of therapeutic massage. Context: Research carried out in outpatient and clinical settings without regard to language or location. Cohort studies, quasi-experimental studies, RCTs, and qualitative studies were among the study designs that qualified. To find pertinent primary papers, systematic reviews and meta-analyses were searched.

Search strategy

The following electronic databases were thoroughly searched from 2015 to 2024: PubMed, Scopus, Embase, CINAHL, and Cochrane Library. The search approach included free-text phrases associated with

Table 1. Study data: sample size, interventions, outcomes, results, and conclusion

Author & year	Study design	(Group-I)	(Group-II)	(Group-III)	Outcome variables (assesment tools)	Result
Mojtaba Miladinia *et al* 2015	two-group RCT, employing a double-blind and repeated measures approach	The intervention group (n=23) received a 5-minute SSBM before each chemotherapy session for six consecutive days, starting from the study's second day	In the control group (n=22), nurses interacted with the children during the intervention period, but no massage was provided		Outcome measures included nausea intensity, assessed using the NRS, and vomiting frequency, monitored daily for 24 hours post-chemotherapy	The study found that SSBM effectively reduced chemotherapy-induced nausea and vomiting (CINV) in pediatric acute leukemia patients
Zohreh Vanaki *et al* 2015	Randomized control trial	The test group (n=36) received TT, targeting the body's first energy layer	The placebo group (n=36) followed the same procedure, but the practitioner's hands remained over 20 *cm* away, avoiding energy transfer	The control group (n=36) received no intervention	Nausea duration, frequency, and intensity were assessed using a 100-*mm* VAS scale, while a checklist tracked nausea occurrences at four intervals: morning, noon, afternoon, and night during chemotherapy's acute phase	The study concluded that TT significantly reduced chemotherapy-induced nausea in breast cancer patients, with notable reductions in all measured variables (P<0.001)
Pegah Matoury-pour *et al* 2016	Single-blind, randomized clinical trial	The intervention group (n=36) received 20 minutes of TT, focusing on the aura and solar chakra	The placebo group (n=36) underwent a simulated TT session, where participants believed they were treated, but no actual touch was performed	The control group (n=36) received no intervention	The primary outcome was the intensity of chemotherapy-induced vomiting, measured using a four-item scale ranging from 0 (no vomiting) to 3 (uncontrollable vomiting)	The study found that TT reduced vomiting intensity in breast cancer patients. However, similar improvements in the placebo group suggest the need for further research to clarify its efficacy

Contd. table 1.

Sowmiya Rajendran *et al* 2016	A quasi experimental post test only design	The study group (n=30) received 20 minutes of Swedish massage daily-24 hours and 30 minutes before chemotherapy and 24 hours after-alongside standard antiemetic medications	The control group (n=30) followed only the hospital's routine of standard antiemetic drugs without massage	CINV levels were assessed using the Modified Rhodes Index of Nausea and Vomiting	The results showed a significant reduction in CINV levels in the Swedish massage group compared to the control group, with a t-valueof -57.03 (p<0.001). This indicates Swedish massage as an effective intervention for reducing CINV in children undergoing chemotherapy
Behrouz Dadkhah *et al* 2019	single-blind randomized controlled trial	The control group (n=30) received standard care, including antiemetic medications to manage chemotherapy-induced nausea and vomiting	The intervention group (n=30) underwent music and periorbital massage therapy, combining 45 minutes of classical and traditional music *via* headphones with a15-minute electronic eye massageduring chemotherapy	Nausea and vomiting levels were assessed using the Rhodes questionnaire	The study concluded that the combination of music therapy and periorbital massage significantly reduced nausea and vomiting in gastrointestinal cancer patients undergoing chemotherapy
Cluny Asha *et al* 2020	A true experimental pretest-posttest research design	The experimental group (n=41) received swedish foot massage in three 20-minute sessions: before, during, and immediately after chemotherapy (10 minutes per leg per session)	The control group (n=41) received routine care without the intervention	The outcome variable NVR were measured using the RINVR	The study concluded that swedish foot massage significantly reduces chemotherapy-induced NVR in patients undergoing highly emetogenic chemotherapy

Contd. table 1.

Farshid Rafiee Sarbijan Nasab *et al* 2021	Randomized clinical trial	The first intervention group (n=25) received a 15-minute abdominal massage with salvia officinalis (AM with AS)	The second group (n=25) received the same massage without aromatic substances (AM without AS). Both interventions were performed twice daily for three consecutive days	The control group (n=25) received routine care without any massage	Nausea severity was assessed using a VAS scale, and vomiting frequency was recorded	The study concluded that abdominal massage, with or without Salvia officinalis, did not significantly reduce nausea or vomiting in cancer patients undergoing chemotherapy
Sakineh Akbari *et al* 2023	Randomized control trial	The massage group (n=33) received one session of Swedish massage therapy	The music group (n=33) listened to selected music during their session. A washout period was observed between interventions		Nausea and vomiting severity were assessed using the VAS scale and the ARINVC	The study found no significant difference between massage and music therapy in reducing chemotherapy-induced nausea and vomiting in children with cancer. However, both interventions significantly reduced the mean severity of nausea and vomiting one hour post-intervention
Ju Won Kim *et al* 2024	Randomized phase II cross-over trial	Group A (n=33) received their first chemotherapy infusion in an EMC, which provided 20-minute mechanical massage sessions, including neck and shoulder kneading, rolling	Group B (n=33) received chemotherapy on a standard bed with only standard care during both cycles.		The primary outcome was the INVR score, while secondary outcomes included the CR rate and QoL, assessed using the	Oncluded that EMC during chemotherapy may help preserve QoL and reduce CINV in high-risk cancer patients. However, the differences in CINV scores between EMC and standard care were not statistically

Contd. table 1.

		massage, and relaxing music. In the second cycle, Group A continued with the EMC therapy			EORTC-QLQ-C30 scale	significant. The findings suggest EMC may not universally reduce CINV but could benefit specific patient subgroups
Shimaa Hassan Khalf allah *et al* 2024	Randomized controlled trial design	The peppermint inhalation group (n=30) received inhalation of peppermint essential oil	The slow-stroke back massage group (n=30) received therapeutic massage	The control group (n=30) did not receive any intervention and served as a baseline for comparison	The severity of nausea and vomiting was measured using the Rhodes Index of Nausea and Vomiting Likert Scale	The study concluded that both peppermint inhalation and slow-stroke back massage significantly alleviated CINV in children with gastrointestinal cancer Peppermint inhalation was found to be slightly more effective than slow-stroke back massage in reducing CINV effects

RCT: Randomised controlled trial; SSBM:Slow stroke back massage; NRS:Numeric rating scale; TT:Therapeutic touch; VAS:Visual analog scale; NVR:Nausea, vomiting, and retching; RINVR:Rhodes Index of Nausea, Vomiting, and Retching; AM:Abdominal massage; AS:Aromatic substance; ARINVC:Adapted Rhodes Index of Nausea and Vomiting for Pediatrics; EMC: electric massage chair; INVR: Index of Nausea, Vomiting, and Retching; CR:complete response; QoL: quality of life; CINV:Chemotherapy induced nausea and vomiting; EORTC-QLQ-C30:European Organization for Research and Treatment of Cancer Quality of Life Questionnaire.

"therapeutic massage," "chemotherapy-induced nausea and vomiting," and "cancer" in addition to Medical Subject Headings (MeSH) (24). The reference lists of the included papers and pertinent systematic reviews were screened in order to find additional records.

Study selection

Using Rayyan software, two independent reviewers (Author 1 and Author 2) filtered the abstracts and titles of the records that were obtained (25). Potentially pertinent studies' full-text articles were evaluated in light of the eligibility requirements. Discussions or consultations with a third reviewer (Author 3) were used to settle the disagreements.

Data extraction

Data were extracted using a standardized extraction form adapted from the Joanna Briggs Institute (JBI) framework (26). Extracted data included study characteristics (authors, year, country), population details (sample size, cancer type), intervention characteristics (massage type, frequency, duration), and outcomes related to CINV.

Data synthesis

A narrative approach was used to summarize the findings, classifying the studies according to the type of intervention, the characteristics of the patients, and the outcomes that were reported (27). Meta-analysis was not conducted due to the variation in study designs and outcome measures.

Quality assessment

The Mixed Methods Appraisal Tool (MMAT) was used to evaluate the listed studies' methodological quality

(28). The evaluation was carried out independently by two reviewers, and disputes were settled by discussion.

Ethical considerations

Ethics approval was not necessary for this study because it is a scoping evaluation of publicly accessible material.

Results

Of the included studies, foot massage and slow-stroke back massage were the most commonly utilized techniques across various patient populations, particularly in pediatric oncology. Foot massage was reported in four studies and consistently showed a reduction in both the frequency and severity of nausea and vomiting. Slow-stroke back massage, especially when combined with aromatherapy (*e.g*., peppermint oil), also demonstrated positive outcomes. Swedish massage and abdominal massage were studied less frequently but indicated comparable benefits in selected populations. Combination therapies (*e.g*., massage+music therapy) yielded enhanced outcomes, suggesting a synergistic effect. However, inconsistencies in sample sizes, assessment tools, and massage duration were observed across studies.

The PRISMA flow diagram (Figure 1) summarizes the article selection procedure, and table 1 provides study data (sample size, interventions, outcomes, results, and conclusion).

Discussion

This review found that foot massage and slow-stroke back massage emerged as the most frequently applied and positively rated interventions for reducing CINV. Foot massage was often preferred for its simplicity and accessibility, particularly in pediatric and outpatient settings. Slow-stroke back massage showed significant results in studies involving both children and adults and was often used in combination with essential oils, enhancing its calming and antiemetic effects. Although Swedish and abdominal massages were less frequently reported, they still demonstrated clinical promise. These findings suggest that standardized protocols for foot and back massage should be prioritized in future trials. The results of several research examining the effectiveness of these therapies are summarized in this discussion.

Numerous studies have been conducted on massage therapy as a possible CINV intervention. The practicality and advantages of slow-stroke back massage in symptom management were highlighted by the notable decreases in nausea and vomiting observed in children with acute leukemia (29). Swedish massage's therapeutic significance was further supported by the discovery that it was successful in lowering CINV levels in children with cancer (30). With a randomized clinical trial showing a decrease in chemotherapy-induced nausea and vomiting, foot massage has also become a promising method, highlighting its patient acceptance and convenience of use (31). Additionally, in cancer patients receiving chemotherapy, abdominal massage, with and without Salvia officinalis, demonstrated encouraging outcomes in lowering nausea and vomiting, indicating the potential for massage techniques infused with herbs (32).

Additionally, therapeutic touch has been studied as a non-invasive CINV management strategy. Research on chemotherapy-treated breast cancer patients found that therapeutic touch therapy decreased the severity of acute vomiting and nausea (33,34). These results point to a psychophysiological process that may affect how nausea is perceived, including relaxation and changes in autonomic nervous system activity.

CINV management has benefited from music therapy, either by itself or in conjunction with massage. Chemotherapy-induced nausea and vomiting were significantly reduced in gastrointestinal cancer patients treated with music therapy and periorbital massage (35). Furthermore, in children with cancer, a randomized controlled trial comparing massage and music therapy revealed that both were helpful in lowering CINV, albeit through possibly distinct mechanisms-mass provided somatosensory relief, while music therapy probably worked through distraction and stress reduction (36).

Additionally, recent developments in massage technology have been investigated. An accessible and self-administered option for patients, an electric massage chair was found to be a beneficial intervention in a phase II cross-over trial assessing the therapeutic benefits of the device on CINV in cancer patients (37). The possibility of incorporating technology into supportive cancer care is shown by this discovery.

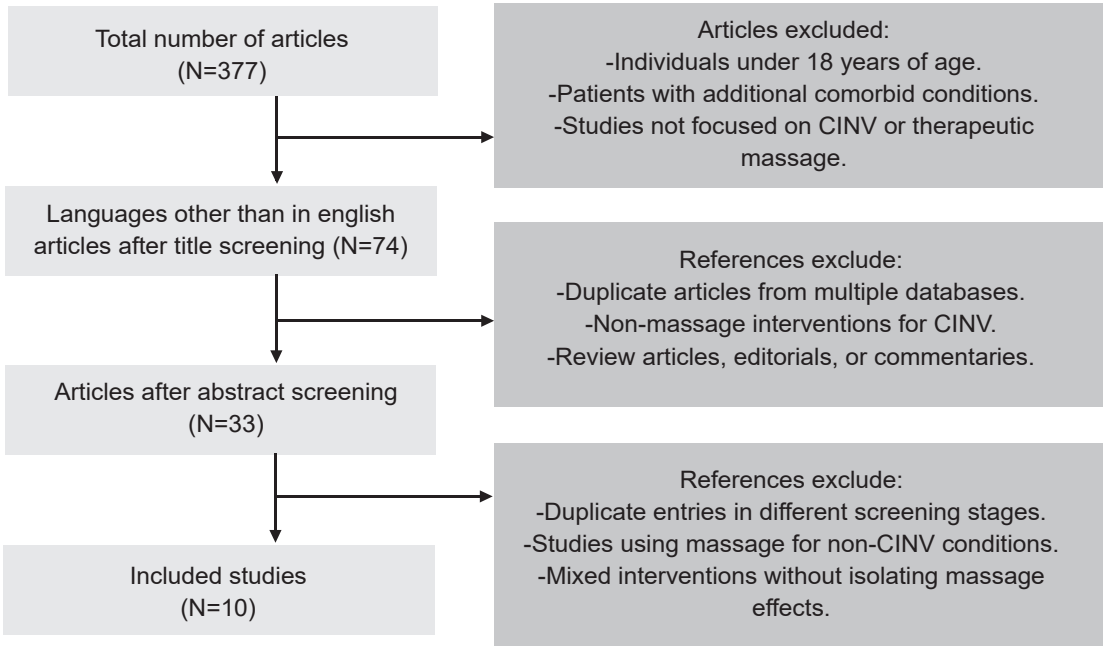

Figure 1. PRISMA flow diagram for selection of articles.

Another possible solution that has been suggested is aromatherapy. Both slow-stroke back massage and peppermint inhalation were reported to be beneficial in treating CINV in children with gastrointestinal cancer, with peppermint inhalation offering a non-contact option for symptom reduction (38). This implies that aromatherapy may be used in addition to or instead of physical therapies, especially when massage may not be practical.

Considering what was mentioned above, the trials highlight how crucial non-pharmacological treatments are for treating CINV. Although different types of massage therapy, including periorbital, foot, abdomen, and back massages, have been shown to be effective, music therapy and aromatherapy are also good substitutes. To further evaluate and improve these therapies for incorporation into routine supportive cancer care, future research should concentrate on mechanistic studies, larger sample numbers, and comparative trials.

Implications for research

This review underscores the potential of therapeutic massage in alleviating CINV, but several research gaps remain unaddressed. One critical area for future exploration is the standardization of massage techniques, as variations in duration, frequency, and method make it challenging to compare results across studies. Conducting large-scale RCTs would provide stronger evidence on its effectiveness and establish massage therapy as a reliable complementary treatment. Additionally, there is a need for longitudinal studies to determine whether the benefits of massage extend beyond immediate relief and persist over multiple chemotherapy cycles.

Another avenue for research is understanding the underlying mechanisms through which massage influences nausea and vomiting, including its effects on the nervous system, gastrointestinal function, and stress hormone regulation. Comparing massage therapy with other non-pharmacological interventions, such as acupuncture or guided relaxation techniques, could help identify the most effective complementary strategies for managing CINV. Furthermore, research should explore the practical integration of massage therapy into standard oncology care, considering factors such as feasibility, cost-effectiveness, and patient preferences. Addressing these gaps will contribute to the development of evidence-based guidelines for incorporating therapeutic massage into cancer treatment plans.

Conclusion

Therapeutic massage shows potential as an adjunctive, non-pharmacological approach for managing chemotherapy-induced nausea and

vomiting. Techniques such as foot massage and slow-stroke back massage, especially when combined with aromatherapy or music therapy, demonstrated encouraging results. Despite these promising findings, the evidence base remains limited by variability in methods and small sample sizes. Future research should aim to standardize massage protocols, incorporate larger and more diverse populations, and assess long-term benefits. This would enable integration of therapeutic massage into supportive cancer care as a validated, patient-centered intervention.

Despite encouraging findings, inconsistencies in study results and methodological limitations highlight the need for further research. Standardizing massage protocols and conducting high-quality clinical trials will be essential in determining its true efficacy. If future studies confirm its benefits, integrating massage therapy into routine oncology care could improve the overall well-being of cancer patients, enhancing their comfort and treatment adherence.

Limitations

While this review provides valuable insights into the role of therapeutic massage in managing CINV, several limitations should be acknowledged. The diversity in study designs, massage techniques, and patient populations makes it difficult to draw definitive conclusions. Many studies had small sample sizes, limiting the generalizability of their findings. Additionally, there was significant variation in how nausea and vomiting were assessed, making it challenging to compare results across different studies. Publication bias may also be a concern, as studies showing positive effects of massage are more likely to be published than those reporting no significant benefit. Furthermore, most research has focused on short-term outcomes, leaving uncertainty about whether massage provides sustained relief over multiple chemotherapy cycles. Contextual differences, such as healthcare settings and cultural attitudes toward massage therapy, may also impact its effectiveness and accessibility. Addressing these limitations through well-designed, large-scale studies will be crucial in determining the role of therapeutic massage as a standardized complementary therapy for managing CINV.

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This study involved a review of publicly available data and did not include human participants or animal subjects. Therefore, ethical approval was not required, and no ethical code number is applicable.

Conflict of Interest

There was no conflict of interest in this manuscript.

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