



PEPPERMINT AROMATHERAPY TO REDUCE NAUSEA AND VOMITING IN POST-OPERATIVE PATIENTS: A LITERATURE REVIEW

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ABSTRACT

Postoperative nausea and vomiting are common complications after surgery and can slow the recovery process and increase the patient's clinical burden. This review aims to synthesize evidence from randomized controlled trials (RCTs) on the effectiveness of peppermint aromatherapy in reducing nausea and vomiting in postoperative patients. This study used a systematic literature review design with the PRISMA approach. Literature searches were conducted through PubMed, ScienceDirect, and Scopus databases in the period 2015–2025 with the keywords peppermint aromatherapy and nausea and vomiting and postoperative care. From the search results based on keywords, 123 articles were obtained, then selected articles were selected using PICOS criteria and limited to randomized controlled trial designs, as many as eight articles that met the inclusion criteria were analyzed qualitatively. All studies showed that peppermint aromatherapy through inhalation methods was able to reduce the intensity and frequency of nausea and vomiting compared to the control group, standard care, or placebo. Peppermint aromatherapy is effective as a non-pharmacological intervention in reducing postoperative nausea and vomiting and has the potential to be used as a safe and practical complementary therapy in nursing practice.

Keywords: nausea and vomiting; peppermint aromatherapy; post-operative care

How to cite (in APA style)

Kuncoro, A. C., & Maliya, A. (2026). Peppermint Aromatherapy to Reduce Nausea and Vomiting in Post-Operative Patients: A Literature Review. *Indonesian Journal of Global Health Research*, 8(4), 827–832. <https://doi.org/10.37287/ijghr.v8i4.2057>.

INTRODUCTION

Postoperative nausea and vomiting is one of the most common complications following surgery and anesthesia, with a prevalence reaching 20–30% in the general population and can increase to 70–80% in patients with high-risk factors (Gan et al., 2020). This condition not only causes discomfort for patients but can also delay recovery, increase the risk of dehydration and electrolyte imbalances, and prolong hospital stays. Furthermore, postoperative nausea and vomiting can potentially increase healthcare costs and decrease patient satisfaction with the healthcare provided.

Management of postoperative nausea and vomiting has traditionally relied primarily on pharmacological therapies such as ondansetron, metoclopramide, and dexamethasone, which have been shown to be effective in reducing nausea and vomiting. However, these medications are associated with side effects such as headache, constipation, and sedation, necessitating safer, less risky, non-pharmacological alternatives. One complementary therapy that is gaining widespread use is aromatherapy, particularly peppermint (*Mentha piperita*), which has natural antiemetic effects (Lee & Fan, 2021).

Aromatherapy is a therapeutic method that uses essential oils from plants to provide therapeutic effects through inhalation or absorption through the skin. Peppermint (*Mentha piperita*) is known to contain active compounds such as menthol and menthone, which play a role in providing a relaxing effect on the smooth muscles of the gastrointestinal tract and increasing gastrointestinal motility,

thus potentially helping to reduce the sensation of nausea and the gag reflex in post-operative patients (Lua & Zakaria, 2020). Furthermore, peppermint aromatherapy also works by stimulating olfactory receptors connected to the limbic system in the brain, which plays a role in regulating emotions and responses to nausea, thus providing a relaxing effect and reducing patient anxiety (Kwon et al., 2022).

From a nursing perspective, peppermint aromatherapy is a practical, easy-to-implement, and non-invasive intervention. This therapy can be administered through inhalation using cotton pads or a diffuser without the need for complex equipment. Furthermore, its relatively low cost and ease of use make peppermint aromatherapy a potential intervention in evidence-based nursing practice to help address PONV (Hines et al., 2021).

However, the use of peppermint aromatherapy in clinical practice still shows varying results influenced by differences in administration method, dosage, and patient characteristics. This indicates a research gap that requires further systematic review. Therefore, this literature review was conducted to analyze the effectiveness of peppermint aromatherapy in reducing nausea and vomiting in postoperative patients.

METHOD

This study used a systematic literature review design aimed to evaluate the effectiveness of peppermint aromatherapy in reducing nausea and vomiting in patients after surgery. Article selection was carried out using the PICOS (Population, Intervention, Comparison, Outcome, Study design) framework. The population studied were patients undergoing surgery regardless of gender, with a focus on adult patients undergoing surgery. The intervention provided was peppermint aromatherapy (*Mentha piperita*) through inhalation using cotton, inhalers, or diffusers. The comparison group consisted of standard care without aromatherapy or a placebo. The primary outcome assessed was the level of postoperative nausea and vomiting, measured using standardized instruments such as the Visual Analog Scale (VAS), Numeric Rating Scale (NRS), and the Rhodes Index of Nausea, Vomiting and Retching (INVR).

The included study designs were limited to randomized controlled trials (RCTs) published in English. A literature search was conducted through three electronic databases, namely PubMed, ScienceDirect, and Scopus, between 2015 and 2025, using the keywords "peppermint aromatherapy," "nausea and vomiting," and "postoperative." The article selection process was carried out in stages, including identification, title and abstract screening, and full-text eligibility assessment. Articles that did not meet the criteria, were not available in full text, or did not use peppermint aromatherapy interventions were eliminated from the selection process. All selection stages were conducted according to PRISMA guidelines, and the results are presented in a PRISMA flowchart.

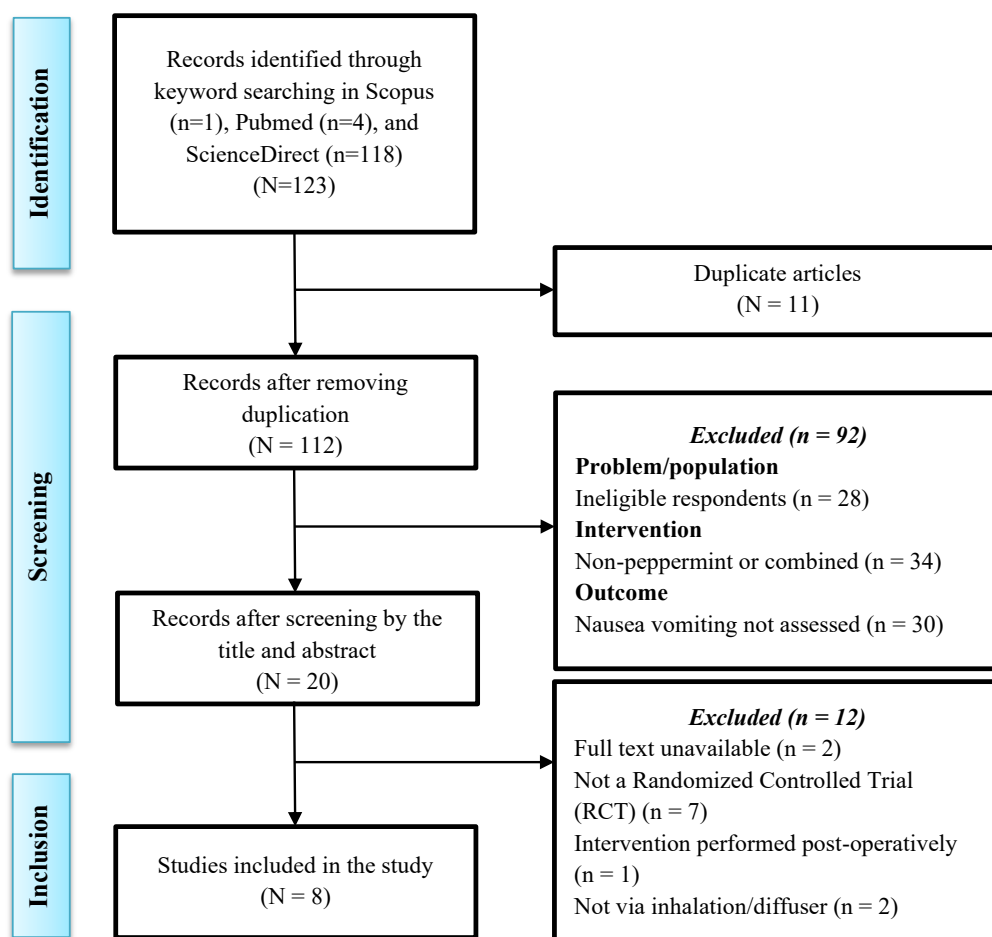


Figure 1. PRISMA Flow Diagram

RESULT

Table 1.
Literature review

Researcher name/year	Title	Population	Intervention	Comparison	Results
Kamalvand et al., 2025	<i>Comparison of the effect of ice sucking containing peppermint with cardamom extract on PONV after laparoscopic cholecystectomy</i>	105 post laparoscopic cholecystectomy patients	Peppermint inhalation with a vaporizer is given post-operatively 4x every 15 minutes.	Cardamom & placebo	Showed that the peppermint group experienced a decrease in nausea, vomiting frequency, and antiemetic requirements compared to placebo.
Tang et al., 2026	<i>Effect of inhaled peppermint essential oil on PONV in laparoscopic gynecologic surgery</i>	106 post Laparoscopic gynecologic patients	Peppermint inhalation with cotton wool is given 10 minutes post-operatively.	Normal saline	Shows that the peppermint group experienced a significant reduction in PONV incidence compared to normal saline.
Maghami et al., 2020	<i>Effect of aromatherapy with peppermint essential oil on nausea and vomiting after</i>	60 post-heart surgery patients	Peppermint inhalation with a nebulizer was given in 3 post-operative	Standard care	Demonstrated a significant reduction in the frequency, duration, and severity of nausea and vomiting compared to

Researcher name/year	Title	Population	Intervention	Comparison	Results
	<i>cardiac surgery</i>		sessions, each session lasting 10 minutes.		standard care.
Karsten et al., 2020	<i>Effects of Peppermint Aromatherapy on PONV</i>	100 general post-operative patients	Peppermint inhalation with cotton wool is given 1 hour post-operatively.	Standard care	Demonstrated a reduction in nausea and vomiting frequency compared to standard care.
Ahmadi et al., 2020	<i>Comparison of the Effect of Inhalation Aromatherapy with 10% and 30% Peppermint Essential Oils on the Severity of Nausea in Abdominal Surgery Patients</i>	120 post abdominal surgery patients	Peppermint inhalation with gauze is given for 5 minutes post-operatively.	Placebo	Showed that the peppermint group experienced a significant reduction in nausea and vomiting compared to placebo.
Parvizi et al., 2025	<i>The effects of peppermint essential oil on postoperative nausea, vomiting, and pain in rhinoplasty patients</i>	80 post rhinoplasty patients	Peppermint inhalation with gauze is given 30 minutes post-operatively.	Placebo	Shows that after being given the intervention, the incidence of nausea and vomiting decreased significantly compared to placebo.
Kulakaç & Sayılan, 2023	<i>Investigation of the Effect of Peppermint Oil Inhalation on Postoperative Nausea-Vomiting and Comfort</i>	62 post-general surgery patients	Peppermint inhalation with gauze is given at 2, 6, 12, 24 hours post-operatively.	Standard care	Shows that peppermint aromatherapy significantly reduces nausea and vomiting in postoperative patients compared to standard care.
Walstab et al., 2025	<i>Promising complementary therapy in the treatment of nausea and vomiting</i>	19 post-general surgery patients	Peppermint inhalation with gauze is given 5 minutes post-operatively.	Placebo	Showed that peppermint was effective in reducing postoperative nausea and vomiting, compared to placebo.

DISCUSSION

Postoperative nausea and vomiting is a complication with complex mechanisms resulting from interactions between the central nervous system, the gastrointestinal system, and the pharmacological effects of anesthesia and surgery (Gan et al., 2020). A literature review showed that most studies reported a reduction in nausea and vomiting frequency after administration of peppermint aromatherapy via inhalation (Maghami et al., 2020; Kulakaç & Sayılan, 2023). These findings indicate that nonpharmacological interventions have an important role as complementary therapies in the management of postoperative nausea and vomiting.

An analysis of eight articles showed that all studies reported a reduction in nausea and vomiting frequency after administering peppermint aromatherapy through inhalation. The interventions were administered using various media such as cotton, gauze, nebulizers, and diffusers, with varying durations and frequencies. Comparisons were made with control groups in the form of standard care, placebo, or other interventions, which generally showed that the group receiving peppermint

aromatherapy had better results in reducing postoperative nausea and vomiting symptoms (Ahmadi et al., 2020; Parvizi et al., 2025).

Physiologically, the effectiveness of peppermint aromatherapy is related to its menthol content, which has an antispasmodic effect on gastrointestinal smooth muscle. This mechanism contributes to reducing gastrointestinal contractions that trigger nausea. The results of the analyzed studies showed a decrease in nausea scores measured using instruments such as the VAS and NRS after the intervention, confirming peppermint's role in stabilizing gastrointestinal function (Lua & Zakaria, 2020; Kwon et al., 2022). Variations in administration methods and intervention duration are among the factors influencing the study results. Despite these differences, the consistent trend in results indicates that peppermint aromatherapy remains effective in various clinical conditions. Measuring outcomes using instruments such as the VAS, NRS, and INVR also provides validity to the results obtained because they use standardized measuring tools (Lee & Fan, 2021).

The implications of these findings for nursing practice indicate that peppermint aromatherapy can be used as a practical, non-invasive intervention with minimal risk of side effects. In addition to improving patient comfort, this intervention also has the potential to reduce dependence on antiemetic medications (Hines et al., 2021). However, several limitations should be considered, such as variations in dosage, duration of administration, and differences in subject characteristics and type of surgery, which may affect the consistency of study results. Overall, the results of this review indicate that peppermint aromatherapy has strong potential as a complementary therapy in reducing postoperative nausea and vomiting. The integration of systematic research methods and consistent results provides a strong foundation for the development of evidence-based interventions in nursing practice (Kligler & Chaudhary, 2021).

CONCLUSION

Based on the results of a literature review, peppermint aromatherapy has been shown to be effective in reducing nausea and vomiting in postoperative patients. All analyzed studies showed symptom improvement after the intervention, particularly through inhalation, which provides a rapid and easy-to-apply effect. The mechanism of action of peppermint aromatherapy is related to its relaxing effect on gastrointestinal smooth muscle and stimulation of the olfactory system, which plays a role in reducing the perception of nausea. The use of peppermint aromatherapy as a non-pharmacological intervention has the advantages of being non-invasive, practical, and having minimal risk of side effects, thus making it a potential complementary therapy in nursing practice.

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