

Section: Medical Surgical Nursing

Aromatherapy using peppermint to alleviate nausea and vomiting post-adenoidectomy

Aisyah Putri Subiningtyas , Nurul Purborini, Sri Hananto Ponco Nugroho, Margono

Authors information

Department of Nursing, Universitas Muhammadiyah Magelang, Indonesia



Contactable email: aisyahptrsubiningtyas@gmail.com / Article DOI: *On process*

Abstract

Postoperative nausea and vomiting (PONV) are a common complication in paediatric patients, particularly those undergoing adenoidectomy. This condition can significantly affect the child's comfort, appetite, and overall recovery process. Peppermint aromatherapy has emerged as a safe and effective complementary therapy for managing nausea. Its active compound, menthol, functions as an antispasmodic and provides a calming effect on the central nervous system, thereby helping to alleviate nausea symptoms. This case study focuses on a preschool-aged patient treated in the Cempaka 1 room of RSUD Temanggung who presented with complaints of nausea following adenoidectomy. Comprehensive nursing care was provided, encompassing assessment, intervention, and evaluation. The primary intervention involved the administration of peppermint aromatherapy via inhalation. The results demonstrated a reduction in the frequency of nausea and an improvement in the patient's appetite. The patient showed signs of enhanced comfort and faster recovery. These findings support the use of peppermint aromatherapy as an effective non-pharmacological approach to managing PONV in paediatric surgical patients. Moreover, the therapy is easy to administer, well-tolerated, and free from significant side effects, making it a valuable addition to postoperative nursing care.

Keywords: Aromatherapy, complementary therapy, nausea, post-adenoidectomy, vomiting

Introduction

Post-operative nausea and vomiting (PONV) remain one of the most common and distressing complications following general anaesthesia, particularly in the paediatric surgical population (Shaikh et al., 2016). Children undergoing procedures like adenoidectomy are at a heightened risk for developing PONV due to factors such as volatile anaesthetics, duration of surgery, and manipulation within the upper airway (Frelich et al., 2025). When it occurs, PONV not only causes significant discomfort and anxiety for the child but can also lead to serious clinical consequences (Chatterjee et al., 2011). These complications include dehydration, electrolyte imbalance, oesophageal tears, and delayed discharge from the post-anaesthesia care unit (PACU). Current prophylactic and therapeutic management rely primarily on pharmacological antiemetics, such as ondansetron or dexamethasone (Kaye et al., 2025; Kang et al., 2025). However, the use of these drugs is sometimes constrained by concerns over potential side effects, cost, or contraindications in certain patients. Therefore, clinical practice actively seeks effective, safe, and easily administered non-pharmacological interventions to supplement standard care and minimize the reliance on systemic medications. Developing accessible methods that rapidly address symptoms while enhancing patient comfort is an essential goal in modern paediatric anaesthesia recovery.

Aromatherapy, specifically utilizing the essence of peppermint (*Mentha piperita*), has emerged as a promising, low-risk, non-pharmacological strategy for managing nausea across various clinical settings (Joulaeerad et al., 2018). The active component primarily responsible for peppermint's therapeutic effect is menthol, a compound known to influence both the central and peripheral nervous systems (Hudz et al., 2023). Inhalation of peppermint essential oil is hypothesized to alleviate nausea by affecting the vomiting centre in the brain, while its known antispasmodic properties also help relax the smooth muscles of the stomach (Mohr et al., 2021). This intervention is non-invasive, cost-effective, and rapidly absorbed into the bloodstream via the pulmonary circulation, offering a quick onset of action. Furthermore, peppermint aromatherapy carries a low risk of side effects when compared to systemic medications, making it especially appealing for vulnerable paediatric patients (Gergő et al., 2025; Parvizi et al., 2025; Maghami et al., 2020). Traditional use and preliminary studies support the application of peppermint oil inhalation for various forms of nausea, yet specific documentation in the context of post-adenoidectomy recovery is sparse. This technique empowers children and their caregivers by providing a simple, patient-controlled method to manage discomfort immediately upon symptom onset.

To contribute specific, evidence-based knowledge to this gap, a detailed case study focusing on a single paediatric patient following adenoidectomy is warranted. Case studies provide invaluable in-depth information on the

sequence of events, patient response, and feasibility of a novel intervention within a complex clinical scenario. By meticulously documenting the patient's nausea and vomiting severity before and after the application of peppermint aromatherapy, this study can illustrate the intervention's immediate clinical impact. This documentation is crucial for understanding the time course of the antiemetic effect and for generating protocols for future clinical application in the PACU setting. Since PONV following upper airway surgery significantly impedes recovery, a successful non-pharmacological approach offers a meaningful improvement to the quality of patient care. The information gathered here will serve as foundational data to support the design of larger, more definitive randomized controlled trials. Therefore, the objective of this case study is to evaluate the feasibility and clinical effectiveness of using peppermint aromatherapy to rapidly alleviate the symptoms of nausea and vomiting in a paediatric patient following adenoidectomy surgery.

Case Description

A 6-year-old boy was admitted to the Cempaka 1 Room of Temanggung Regional Hospital following an adenoidectomy procedure performed on January 13, 2025, at 1:25 PM. Postoperatively, the patient experienced nausea and vomiting accompanied by a noticeable decrease in appetite. According to the patient's mother, the symptoms of nausea began immediately after the child was transferred out of the operating room. The child appeared weak and was only able to consume 2–5 spoonfuls of food. Physical examination revealed a generally weak condition, with alert consciousness, pale and dry lip mucosa, and signs of restlessness. Anthropometric measurements recorded a weight of 15.3 kg and a height of 93 cm, resulting in a BMI of 17.3 kg/m², which is at the threshold of overweight for his age. Supporting laboratory tests showed haematological values within normal limits, except for slightly decreased platelet count, mean corpuscular volume (MCV), and mean corpuscular haemoglobin (MCH), all of which were below the reference range. Chest X-ray findings indicated no abnormalities, with normal lung and heart configuration. Based on the assessment, the primary nursing diagnosis established was nausea (D.0076), related to the effects of pharmacological agents (anaesthesia). This diagnosis was supported by clinical indicators including the patient's weak appearance, maternal reports of postoperative nausea and vomiting, and reduced appetite. The targeted nursing outcome was an improvement in the level of nausea (L.08065), which would be evaluated through both subjective and objective indicators such as decreased nausea episodes, increased food intake, and overall improvement in the patient's condition. The nursing care plan adopted an Evidence-Based Practice (EBP) approach, utilizing inhalation peppermint aromatherapy as a non-pharmacological intervention. Scientific literature supports the use of peppermint in alleviating nausea induced by anaesthesia, primarily through the action of menthol, which relaxes the smooth muscles of the gastrointestinal tract and calms the central nervous system. This intervention is considered safe, easy to administer, and free from significant side effects, making it a suitable option for paediatric postoperative care.

Discussion

The clinical outcome observed in this case study provides encouraging evidence supporting the immediate efficacy of peppermint aromatherapy as a non-pharmacological rescue therapy for PONV following adenoidectomy. Upon initiating the inhalation of the peppermint essential oil, the patient's reported nausea scores exhibited a rapid and notable decline, quickly moving toward complete resolution of the distressing symptoms. This swift therapeutic effect is primarily attributed to the high concentration of menthol in the oil, which exerts both a systemic and local effect. Menthol acts as an antispasmodic agent, helping to relax the smooth muscles of the gastrointestinal tract, thereby reducing the sensation of nausea and inhibiting the emetic reflex (Heghes et al., 2019; Chumpitazi et al., 2018). Furthermore, the olfactory input bypasses the digestive system and directly influences the limbic system and the vomiting centre in the brainstem, leading to a quick onset of relief. The intervention proved highly feasible, requiring minimal staff training and easily integrated into the Post-Anesthesia Care Unit (PACU) recovery protocol. This successful application validates the mechanism of action reported in other surgical contexts and highlights its particular suitability for the paediatric population. The immediate relief achieved strongly suggests that peppermint aromatherapy is a valuable tool for patient comfort and potentially accelerating recovery time.

The significance of utilizing peppermint aromatherapy in this setting lies in its role as a safe and effective adjunct to conventional antiemetics, promoting a multi-modal approach to pain and symptom management. While pharmacological options are effective, they are associated with potential side effects, such as QT prolongation or extrapyramidal symptoms, which are especially concerning in children. By rapidly resolving nausea using a non-systemic method, the need for repeated or escalating doses of rescue antiemetics is potentially minimized, reducing the overall drug burden on the patient. This intervention also provides the child with a simple, self-soothing technique, which can help mitigate the anxiety and distress often associated with severe PONV. The positive experience reported in this case study underscores the importance of integrating patient-preferred sensory interventions into standard paediatric care plans. The cost-effectiveness and ready availability of peppermint oil further advocate for its routine inclusion as a first-line non-pharmacological option in the post-operative setting. Thus, the successful outcome here reinforces the clinical benefit of adopting holistic, low-risk methods for common post-surgical complications (Hakami, 2024; Stoicea et al., 2015).

Despite the positive outcome, the interpretation of these findings requires acknowledging the limitations inherent to a single case study design, necessitating clear directions for future research. Although the observed therapeutic effect was compelling, it is impossible to definitively rule out a significant placebo effect or the influence of the natural resolution of the symptoms over time. Therefore, the results cannot be immediately generalized across all paediatric patients undergoing adenoidectomy due to individual variability in PONV risk and response to aromatherapy. To definitively establish the efficacy and guide clinical practice, Randomized Controlled Trials (RCTs) are essential to rigorously compare peppermint aromatherapy against both a placebo (e.g., saline inhalation) and standard antiemetic prophylaxis. Future investigations should also aim to determine the optimal concentration and duration of peppermint essential oil inhalation required to achieve sustained antiemetic effects. Furthermore, research should incorporate objective measures, such as monitoring salivary output or heart rate variability, to complement subjective symptom scores and further elucidate the precise neurological and physiological mechanisms involved. This case study serves as a crucial foundation, warranting further high-level evidence to confirm the routine use of peppermint aromatherapy in paediatric surgical recovery.

Conclusion

The findings from this case study strongly suggest that aromatherapy using peppermint essential oil is an effective, non-pharmacological intervention for rapidly alleviating PONV. The observed patient experienced a quick reduction in the severity and frequency of these symptoms following the inhalation of peppermint oil, aligning with evidence that peppermint's antiemetic properties, derived from menthol, exert their effect by relaxing gastrointestinal smooth muscle and acting on olfactory receptors that influence the vomiting centre. This successful application supports the immediate integration of peppermint aromatherapy into post-operative care protocols in paediatric surgical settings as a safe, cost-effective, and patient-preferred adjunct to standard antiemetics. For future research, it is recommended to conduct larger, randomized controlled trials (RCTs) to compare the efficacy of peppermint aromatherapy directly against standard prophylactic antiemetic drugs and a placebo control across a diverse paediatric surgical population. Furthermore, future studies should focus on establishing the optimal concentration and duration of peppermint inhalation required for maximal antiemetic effect, and objectively measure physiological markers (e.g., heart rate variability) alongside self-reported symptom scales to better elucidate the underlying mechanism of action in reducing PONV.

References

- Chatterjee, S., Rudra, A., & Sengupta, S. (2011). Current concepts in the management of postoperative nausea and vomiting. *Anesthesiology research and practice*, 2011, 748031. <https://doi.org/10.1155/2011/748031>
- Chumpitazi, B. P., Kearns, G. L., & Shulman, R. J. (2018). Review article: the physiological effects and safety of peppermint oil and its efficacy in irritable bowel syndrome and other functional disorders. *Alimentary pharmacology & therapeutics*, 47(6), 738–752. <https://doi.org/10.1111/apt.14519>
- Frelich, M., Burša, F., Jor, O., Vodička, V., Křenková, K., Vítková, N., Kondé, A., Parma, M., Buršík, D., Šámaj, P., Walachová, N., Kantor, P., Hranková, V., Motalová, S., & Sklienka, P. (2025). Effect of second-hand smoking on the incidence of postoperative nausea and vomiting in children after adenoidectomy: a single-centre retrospective study. *Journal of anesthesia, analgesia and critical care*, 5(1), 67. <https://doi.org/10.1186/s44158-025-00284-5>
- Gergő, D., Garmaa, G., Tóth-Mészáros, A., To, U. N. D., Fehérvári, P., Harnos, A., Hegyi, P., Nagy, R., Bánvölgyi, A., Ványolós, A., & Csupor, D. (2025). Inhaling Peppermint Essential Oil as a Promising Complementary Therapy in the Treatment of Nausea and Vomiting. *Journal of clinical medicine*, 14(14), 5069. <https://doi.org/10.3390/jcm14145069>
- Hakami N. (2024). Integrating complementary and alternative medicine in surgical care: A narrative review. *Medicine*, 103(41), e40117. <https://doi.org/10.1097/MD.00000000000040117>
- Heghes, S. C., Vostinaru, O., Rus, L. M., Mogosan, C., Iuga, C. A., & Filip, L. (2019). Antispasmodic Effect of Essential Oils and Their Constituents: A Review. *Molecules*, 24(9), 1675. <https://doi.org/10.3390/molecules24091675>
- Hudz, N., Kobylinska, L., Pokajewicz, K., Horčinová Sedláčková, V., Fedin, R., Voloshyn, M., Myskiv, I., Brindza, J., Wieczorek, P. P., & Lipok, J. (2023). *Mentha piperita*: Essential Oil and Extracts, Their Biological Activities, and Perspectives on the Development of New Medicinal and Cosmetic Products. *Molecules (Basel, Switzerland)*, 28(21), 7444. <https://doi.org/10.3390/molecules28217444>
- Joulaeerad, N., Ozgoli, G., Hajimehdipoor, H., Ghasemi, E., & Salehimoghaddam, F. (2018). Effect of Aromatherapy with Peppermint Oil on the Severity of Nausea and Vomiting in Pregnancy: A Single-blind, Randomized, Placebo-controlled trial. *Journal of reproduction & infertility*, 19(1), 32–38.
- Kang, Y., Koshika, K., Takashima, K., Nakakuki, A., Hasunuma, K., Hayashi, M., Miyamoto, K., Yamamoto, M., Yoshida, K., & Ichinohe, T. (2025). Dexamethasone and Ondansetron Combined Decreases Postoperative Nausea and Vomiting in Orthognathic Surgery Compared With Dexamethasone Alone: A Prospective Randomized Controlled Trial. *Anesthesia progress*, 72(1), 3–8. <https://doi.org/10.2344/23-0019>

- Kaye, A. D., Turpin, D. B., Shah, S., Abbott, B., Hollander, A. V., Burroughs, C. R., Myers, S. H., Ahmadzadeh, S., Mathew, J., Kaye, A. M., Shekoohi, S., & Varrassi, G. (2025). The Pharmacological and Clinical Roles of Antiemetics: A Narrative Review. *Cureus*, 17(1), e77370. <https://doi.org/10.7759/cureus.77370>
- Maghami, M., Afazel, M. R., Azizi-Fini, I., & Maghami, M. (2020). The effect of aromatherapy with peppermint essential oil on nausea and vomiting after cardiac surgery: A randomized clinical trial. *Complementary therapies in clinical practice*, 40, 101199. <https://doi.org/10.1016/j.ctcp.2020.101199>
- Mohr, C., Jensen, C., Padden, N., Besel, J. M., & Brant, J. M. (2021). Peppermint Essential Oil for Nausea and Vomiting in Hospitalized Patients: Incorporating Holistic Patient Decision Making Into the Research Design. *Journal of holistic nursing: official journal of the American Holistic Nurses' Association*, 39(2), 126–134. <https://doi.org/10.1177/0898010120961579>
- Parvizi, A., Pour Mohammad, R., Haddadi, S., Kia, S. R., Akbari, M., & Yazdanipour, M. A. (2025). The effect of peppermint essential oil on postoperative nausea, vomiting, and pain in rhinoplasty patients: a randomized clinical trial. *Annals of medicine and surgery* (2012), 87(5), 2689–2695. <https://doi.org/10.1097/MS9.0000000000003032>
- Shaikh, S. I., Nagarekha, D., Hegade, G., & Marutheesh, M. (2016). Postoperative nausea and vomiting: A simple yet complex problem. *Anesthesia, essays and researches*, 10(3), 388–396. <https://doi.org/10.4103/0259-1162.179310>
- Stoicea, N., Gan, T. J., Joseph, N., Uribe, A., Pandya, J., Dalal, R., & Bergese, S. D. (2015). Alternative Therapies for the Prevention of Postoperative Nausea and Vomiting. *Frontiers in medicine*, 2, 87. <https://doi.org/10.3389/fmed.2015.00087>