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Original Research Paper

Effectiveness of peppermint aromatherapy on post-operative nausea and vomite spinal anesthesia

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Abstract
Spinal anesthesia or regional anesthesia is a procedure performed prior to surgery that helps ensure the patient feels safe and comfortable during the operation and avoids pain during the procedure. One of the effects of spinal anesthesia is postoperative nausea and vomiting. Peppermint aromatherapy is used to reduce the nausea and vomiting score after surgery with spinal anesthesia. This study is a quantitative experimental research with a quasi-experimental design using a pre-test post-test with control group approach. The sampling technique used was simple random sampling with a total of 30 respondents. Administration of aromatherapy for 15 minutes in the intervention group showed a Wilcoxon test result of 0.003 < 0.05, while in the control group the result was 0.090 > 0.05. Based on the Mann-Whitney test, the p-value was 0.015 < 0.05. There was a significant reduction in nausea and vomiting in the group given aromatherapy compared to the group that did not receive aromatherapy in postoperative spinal anesthesia patients. The results of this study are expected to support the use of peppermint aromatherapy as an alternative to reduce nausea and vomiting scores in postoperative patients under spinal anesthesia

Keywords: peppermint aromatherapy; postoperative nausea and vomiting (PONV); spinal anesthesia

1. Introduction

Spinal anesthesia, or regional anesthesia, is a procedure performed before surgery to ensure the patient feels safe and comfortable during surgery and to avoid pain during the operation (Yunita et al., 2023). Spinal anesthesia offers the advantages of simplicity and effectiveness in sensory and motor blockade, particularly in lower extremity surgery (Santoso et al., 2023). Common postoperative side effects include nausea and vomiting.

Postoperative nausea and/or vomiting (PONV) is a condition of nausea and/or vomiting that occurs in the first 24 hours after surgery with anesthesia (Anditiawan et al., 2023) . The incidence of PONV in patients after surgery reaches 30% and increases to 80% in high-risk patients (coivuranta score >3) (Widyanti, 2024). The incidence of postoperative nausea and vomiting in the recovery room generally reaches 30% of patients undergoing surgery. The prevalence of nausea and vomiting can reach 70% in high-risk patients (Fransisca et al., 2019). Efforts to reduce the incidence of postoperative nausea and vomiting can be done with several strategies for preventing and treating nausea and vomiting, both with pharmacological and non-pharmacological therapies. Complementary non-pharmacological approaches (aromatherapy, acupuncture, acupressure, relaxation therapy, hypnotherapy, and music therapy) (Safiya et al., 2016) . Treatment with non-pharmacological or complementary therapies for various health problems is increasing because it is relatively easy to do and does not cause side effects (Masruroh et al., 2025).

Effective complementary therapy can help in the management of nausea and vomiting due to surgery (Rosidah et al., 2023). Aromatherapy is a complementary treatment method using the aroma of

essential oils produced from plants (Widagagdo, 2014). The use of aromatherapy aims to influence a person's emotions and mood. Aromatherapy can be administered in several ways, including inhalation, bathing, massage, and compresses (Warjiman et al., 2017). The psychological effect of peppermint is calming. Peppermint aromatherapy can also be an antiemetic with a fast onset, easy to administer, minimal side effects, and inexpensive (Fransisca et al., 2019). Administering peppermint aromatherapy therapy by inhalation or inhalation in post-surgery patients with general anesthesia can reduce the average score of nausea and vomiting from an initial score of 9.70 and after being given peppermint aromatherapy to 7.50 (Rihiantoro et al., 2018).

Based on the explanation above, the researchers intend to conduct a study on the effect of peppermint aromatherapy on postoperative nausea and vomiting under spinal anesthesia. The results are expected to be used to advance knowledge in the application of complementary therapies.

2. Research Methods

This study was a quasi-experimental study with a pretest and posttest design with a control group. The aim was to determine the effect of progressive muscle relaxation on anxiety levels in patients. The sampling technique used in this study was the consecutive sampling technique. Sampling with a sample size of 30 people per group. Data analysis used univariate and bivariate. The measuring instrument used was the Gordon nausea and vomiting observation sheet.

3. Results and Discussion

Table 1. Pre and Post Nausea and Vomiting Incidents in Each Group

Group	Category	Mean Ranks	Sum Ranks	Z	Significance
Control Group	pretest	7.70	77.00	-1,698	p=0.090
	posttest	7.00	28.00		
Aromatherapy Group	Pretest	7.21	86.50	-2,961	p=0.003
	Posttest	4.50	4.50		

The results of the Wilcoxon test in Table 1 show that the aromatherapy group had a difference in nausea and vomiting scores before and after being given aromatherapy, while the control group had a p value of 0.090 (>0.05), which means there was no significant difference in nausea and vomiting scores before and after treatment.

Table 2. The Effect of Aromatherapy on Nausea and Vomiting

Category	Group	n	Mean Rank	Asymp. Sig (2-tailed)
Post-operative nausea and vomiting	Intervention	30	14.64	p=0.015
	Control	30	22.36	

Table 2 shows the difference in nausea and vomiting scores between the peppermint aromatherapy intervention group and the control group, with a p-value of 0.015 (<0.05), indicating a difference. The aromatherapy intervention group was more effective in reducing nausea and vomiting scores compared to the control group. Lavender essential oil , containing linalool, has a relaxing effect. This compound can help release inhibited serotonin. Serotonin is a chemical in the body that plays a role in regulating emotions and moods and can reduce disorders such as anxiety and depression. Increased serotonin

levels can reduce catecholamines and steroids, or stress-inducing hormones (Mirazanah et al., 2021). This is in line with related research , which concluded that inhaled peppermint aromatherapy is generally effective in reducing nausea and vomiting (Lisnawati et al., 2021). Other research also demonstrated the effect of blended peppermint and ginger oil aromatherapy on nausea in pregnant women in the third trimester (Sunaeni , 2022). Aromatherapy works by diverting nausea and vomiting stimuli to relaxing and refreshing stimuli, thus eliminating or reducing the nausea reflex (Lisnawati et al., 2021). Using peppermint aromatherapy inhalation for 5 minutes can have an effect on reducing the scale of nausea in chemotherapy patients (Rihiantoro et al., 2018). This is because peppermint aromatherapy inhalation directly affects the nerves in the brain so that its effects can be felt immediately by the patient after inhaling it. Pharmacologically, the fragrance of essential oils (EO) can send effects directly to the central nervous system and the endocrine system without being consciously aware (Lisnawati et al., 2021). Through inhalation, volatile molecules of essential oils that pass through olfactory receptors in the nose recognize these molecular characteristics and send signals to the brain through the olfactory nerves. Some of the main components of these molecules enter the bloodstream through the lungs and directly affect the nerves in the brain after passing through the blood-brain barrier (Sunaeni, 2022). This condition can suppress stress stimulation which causes the body to feel comfortable and can suppress nausea and vomiting reflexes (Komalasari et al., 2024).

Based on the test results, a p-value of 0.015 (<0.050) was obtained, indicating that peppermint aromatherapy has an effect on reducing nausea and vomiting. Symptoms of nausea and vomiting themselves can occur due to impaired blood flow to the brain due to a significant decrease in blood pressure (hypotension), which then affects the Chemoreceptor Trigger Zone (CTZ) and the area postrema. When inhaled, volatile compounds in essential oils are recognized by olfactory receptors in the nose based on their chemical properties. Signals from these receptors are sent to the brain via the olfactory nerve. In addition, some active compounds from essential oils are absorbed into the bloodstream through the lungs and can cross the blood-brain barrier, then directly affect the central nervous system (Sunaeni , 2022).

15 minutes of aromatherapy has been shown to reduce nausea and vomiting. Stimulating the olfactory nerves activates the limbic system in the brain—the region responsible for regulating emotions—resulting in a calmer body and reduced nausea.

4. Conclusion

Postoperative peppermint aromatherapy can reduce nausea and vomiting scores with a p-value of 0.015, indicating that peppermint aromatherapy is more effective in reducing nausea and vomiting scores compared to the control group. Inhaling peppermint aromatherapy directly affects the nerves in the brain, so its effects can be felt immediately by patients after inhaling it.

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