



PEPPERMINT AND GINGER AROMATHERAPY FOR MANAGING NAUSEA AND VOMITING DURING CHEMOTHERAPY

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ABSTRACT

Nausea and vomiting are common side effects experienced by breast cancer patients undergoing chemotherapy. Complementary therapies, such as peppermint and ginger aromatherapy, have been widely studied as alternatives to relieve these symptoms. However, the effectiveness of each type of aromatherapy needs further evaluation. Objective: This study aims to analyze the effectiveness of peppermint and ginger aromatherapy in reducing nausea and vomiting in breast cancer patients undergoing chemotherapy. Methods: A Quasi-Experimental design was used with 28 breast cancer patients at Husada Hospital Jakarta, divided into two groups: peppermint and ginger. Nausea and vomiting levels were measured before, 2 hours, and 6 hours after chemotherapy and analyzed using ANOVA Repeated Measures and Independent T-Test. Results: The results showed that both peppermint and ginger aromatherapy significantly reduced nausea and vomiting after chemotherapy ($p < 0.05$). However, at 6 hours after chemotherapy, the peppermint group had lower average nausea and vomiting scores compared to the ginger group (6.57 vs. 10.29, $p = 0.036$). This indicates that peppermint is more effective than ginger in reducing nausea and vomiting after chemotherapy. Conclusion: Both peppermint and ginger aromatherapy are effective in reducing nausea and vomiting in breast cancer patients undergoing chemotherapy. However, peppermint showed higher effectiveness compared to ginger at the 6-hour post-chemotherapy time point. Future research could explore the combination of peppermint and ginger aromatherapy to enhance effectiveness in reducing nausea and vomiting in breast cancer patients.

Keywords: breast cancer; chemotherapy; cinv; ginger; nausea; peppermint; vomiting

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INTRODUCTION

Breast cancer is a disease caused by the growth of abnormal cells in breast tissue, and can spread to other parts of the body. In Indonesia, breast cancer is the most common type of cancer, with more than 65,000 new cases in 2020. The increase in the number of cases triggers a greater need for chemotherapy (Ministry of Health of the Republic of Indonesia, 2019). Chemotherapy can cause significant side effects, especially nausea and vomiting (CINV), which is experienced by 70-80% of patients. This nausea can reduce quality of life and hinder the continuation of treatment, even though antiemetic drugs are available. Approximately 80% of patients with certain types of chemotherapy still experience this side effect (Kim, 2017). The working mechanism of these two aromatherapies is related to the serotonin system in the body. Peppermint is known to increase serotonin levels in the brain, which plays a role in regulating nausea and vomiting, and provides a relaxing effect. Likewise, ginger has an antiemetic effect by inhibiting serotonin receptors in the digestive tract and central nervous system. This increase in serotonin levels helps reduce nausea that is often experienced by chemotherapy patients (Masrurh & Wulan, 2021).

Complementary therapies such as aromatherapy are an option for treating nausea and vomiting due to chemotherapy. Essential oils such as peppermint and ginger have been shown

to be effective as a safe and easily accepted alternative for patients. Research shows that peppermint aromatherapy can relieve nausea by providing a relaxing effect and increasing serotonin secretion (Hines, 2017).Ginger aromatherapy is also effective in reducing nausea and vomiting after chemotherapy. Inhalation of ginger essential oil quickly gives effect by inhibiting serotonin receptors in the digestive and central nervous systems. Research shows that peppermint is preferred by patients because it is effective and easily accepted compared to pharmacological drugs (Ji Min, 2017).Studies have shown that peppermint aromatherapy is effective in reducing the severity of nausea after chemotherapy. Several studies have shown that the use of peppermint reduces nausea in breast cancer patients and pregnant women in the first trimester. Peppermint aromatherapy is more effective than pharmacological treatment in some patients.

Other studies have confirmed the findings that peppermint aromatherapy is effective in treating nausea. Concentrations of 10% and 30% peppermint essential oil have been shown to be equally effective in reducing nausea and vomiting, suggesting that peppermint aromatherapy is a safe option for chemotherapy patients (Hasibuan and Hasanah, 2021).In addition to peppermint, ginger aromatherapy is also effective in treating nausea and vomiting due to chemotherapy. Ginger essential oil has an antiemetic effect by inhibiting serotonin receptors in the digestive and central nervous systems, and is considered safe with few side effects (Gun, 2019). Aromatherapy not only reduces nausea, but also increases patient comfort and is an effective alternative for patients who do not respond to antiemetic drugs. The purpose of this study was to analyze the effectiveness of peppermint and ginger aromatherapy on nausea and vomiting in breast cancer patients undergoing chemotherapy.

METHOD

This study used a quasi-experimental design with repeated measurements in two aromatherapy intervention groups (peppermint and ginger), involving 28 respondents selected through purposive sampling. Each group consisted of 14 people.Research at Husada Hospital Jakarta collected data using the INVR (Index Nausea Vomiting and Retching) questionnaire for nausea and vomiting and GAD-7 (General Anxiety Disorder-7) for patient anxiety with reability a corbach alpa 0,876. Aromatherapy intervention was carried out three times on each respondent. The normality test used Shapiro-Wilk, the independent T test for bivariate analysis, and changes in nausea and vomiting were analyzed using Repeated Measures ANOVA. The variables measured were nausea and vomiting and anxiety.

RESULT

Table 1 shows that the majority of breast cancer patients at Husada Hospital Jakarta have an average age of around 47 years in the 2 peppermint and ginger groups. In this study, the characteristics of breast cancer patients undergoing chemotherapy showed several factors that influenced the incidence of nausea and vomiting (CINV). Age is an important factor, where older patients tend to be more susceptible to the side effects of nausea and vomiting. Decreased body function, such as in the kidneys and liver, affects the ability to metabolize chemotherapy drugs, which worsens the symptoms of nausea and vomiting. Epidemiological theory states that age is a major risk factor in breast cancer, with the highest incidence in women aged 50-60 years (Apfel, 2018).Research by Johnson (2023) and Brown (2021) showed that supportive therapies such as aromatherapy with peppermint and ginger can relieve symptoms of nausea and vomiting in elderly patients. The researchers' analysis showed that age plays a significant role in increasing the intensity and duration of nausea and vomiting in breast cancer patients undergoing chemotherapy. Therefore, special attention needs to be given to elderly patients, including the use of additional therapies to reduce these side effects.

Table 1.
Distribution of Characteristics of Breast Cancer Patients Undergoing Chemotherapy (n=28)

Variables	Aromatherapy	
	Peppermint (n=14)	Ginger (n=14)
Age (mean ± SD)	47.0 ± 4.8	47.6 ± 5.2
Smoking (f;%)	Do not smoke	12 ; 86%
	Smoke	2 ; 14%
Nausea Vomiting (f; %)	No	9 ; 64%
	Nausea Vomiting	5 ; 36%
Obesity (f; %)	Not Obese	11 ; 79%
	Obesity	3 ; 21%
Anxiety (f; %)	Light	10 ; 72%
	Currently	2 ; 14%
	Heavy	2 ; 14%
Type of Drug (f; %)	Docetaxel	1 ; 7%
	Doxorubicin	5 ; 36%
	Cisplatin	8 ; 57%
Drug Category (f; %)	Weak	1 ; 7%
	Currently	5 ; 36%
	Strong	8 ; 57%
Chemotherapy Cycle (f; %)	Cycle 3	1 ; 7%
	Cycle 4	5 ; 36%
	Cycle 5	8 ; 57%

Most respondents did not smoke (86% in the peppermint group and 93% in the ginger group). Smoking history also plays a role in the occurrence of nausea and vomiting during chemotherapy. Although most patients in this study did not smoke, smoking habits can increase their susceptibility to nausea and vomiting. Nicotine in cigarettes can damage the digestive system and increase anxiety, which contributes to the intensity of nausea and vomiting symptoms. Lee (2022) stated that smokers tend to experience more severe nausea and vomiting after chemotherapy because nicotine affects drug metabolism and the body's response to treatment. The researcher's analysis emphasizes the importance of considering smoking habits in planning chemotherapy and supporting therapy for patients, especially in managing nausea and vomiting. Most respondents were not obese (79% on peppermint, 86% on ginger), although the impact of obesity on chemotherapy-induced nausea and vomiting (CINV) remains relevant to discuss. Obesity can affect body metabolism, drug distribution, and increase inflammation, which ultimately worsens chemotherapy side effects, including nausea and vomiting. Although patients with normal weight are still at risk of experiencing these symptoms, CINV management must consider individual factors, such as treatment history, genetic factors, and psychological factors. For example, a study by Johnson (2023) showed that patients with a history of motion sickness or morning sickness were more likely to experience nausea and vomiting after chemotherapy, even though they were not obese.

Previous history of nausea and vomiting also influences the likelihood of CINV. Patients with a history of motion sickness or morning sickness are at higher risk of experiencing more severe nausea and vomiting during chemotherapy. Psychological theory suggests that previous negative experiences can cause an anticipatory response to CINV, increasing anxiety and symptom intensity. Studies by Johnson (2023) and Martin (2020) showed that patients with a history of nausea and vomiting reported more severe CINV events. The researchers' analysis concluded that understanding a patient's history of nausea and vomiting is essential for planning better CINV management, including using appropriate supportive therapies to improve patient comfort during chemotherapy. Most respondents had mild anxiety (72% in the peppermint and 64% in the ginger group). The majority of patients in this study showed mild levels of anxiety, which can worsen the intensity of nausea and vomiting through the anticipatory response, which is nausea or vomiting that occurs before treatment begins. Research by Martin (2020) and Jones (2019) shows that anxiety can increase patients'

sensitivity to body changes that occur after treatment, which in turn worsens symptoms of nausea and vomiting. Therefore, anxiety management is very important in reducing the negative impact of chemotherapy side effects, as well as improving patients' quality of life.

Most patients received chemotherapy with cisplatin (57% in both groups) and a strong drug category (57% in both groups). Cisplatin, the most commonly used chemotherapy drug in most patients in this study, is known as one of the highly emetogenic agents, which has a high tendency to cause nausea and vomiting. Research by Navari & Aapro (2016) explains that cisplatin can cause severe CINV, especially in patients with high anxiety or a history of nausea and vomiting. Therefore, the management of CINV in patients receiving cisplatin requires a more intensive approach, including the administration of antiemetic drugs before, during, and after treatment to reduce the intensity of these side effects. In addition, strong chemotherapy drugs such as cisplatin and doxorubicin, which are often used in patients with advanced breast cancer, require more effective management strategies to prevent or reduce CINV. Most patients underwent the 5th chemotherapy cycle (57% in both groups). In subsequent cycles, patients often reported increased CINV severity, which may be due to a decrease in the body's response to treatment or accumulation of side effects. A study by Ruhlmann et al. (2021) showed that patients who experienced CINV in the first or second cycle tended to experience severe CINV in subsequent cycles. Therefore, CINV management needs to be adjusted to the patient's individual condition, including the use of appropriate antiemetic drugs and psychological support to reduce anxiety.

Table 2.
Distribution of Nausea and Vomiting Based on Peppermint and Ginger Aromatherapy Interventions (n=28)

Intervention	30 Minutes Before Chemo	2 Hours After Chemo	6 Hours After Chemo
	Mean	Mean	Mean
Peppermint	20.00	15.86	6.57
Ginger	18.36	14.14	10.28

Table 2 shows that intervention with peppermint aromatherapy resulted in a more significant decrease in nausea and vomiting, with the lowest average of 6.57 after 6 hours of chemotherapy, compared to ginger which had the lowest average of 10.28. Peppermint aromatherapy has a significant impact on reducing nausea and vomiting in breast cancer patients after chemotherapy at Husada Hospital Jakarta. Before chemotherapy, the level of nausea and vomiting varied with an average of 20.00 and a score range of 14 to 26, which can be influenced by anxiety and perception of treatment. After 2 hours after chemotherapy, there was a significant decrease with an average of 15.86, indicating improvement although there was still variation. The most striking decrease occurred after 6 hours, with an average of 6.57, indicating the effectiveness of peppermint aromatherapy in relieving nausea and vomiting. The antispasmodic effect of peppermint, which can affect the digestive system and brain, is believed to be the main mechanism. Previous studies by Wilson (2024) and Gupta et al. (2021) support these findings, showing that peppermint has antiemetic properties that reduce chemotherapy-induced nausea. Based on these results, peppermint aromatherapy can be used as a supportive therapy to reduce symptoms of nausea and vomiting after chemotherapy, taking into account psychological factors that influence these symptoms. Further research with larger samples and additional variables is expected to enrich the understanding of the effectiveness of aromatherapy in managing chemotherapy side effects.

Table 3.
Differences in Nausea and Vomiting in Breast Cancer Patients Given Peppermint Aromatherapy and Ginger Aromatherapy (n=28)

Intervention	Mean	SD	Sig
Peppermint	6.57	2.82	0.006
Gnger	10.28	5.47	

Based on the results of the independent T Test in table 5.7, the sig value for both variables for the intervention group was <0.05, meaning that there was a significant difference in changes in nausea and vomiting in breast cancer patients undergoing chemotherapy after being treated with peppermint aromatherapy or Husada Hospital Aromatherapy Jakarta in 2025.

Table 4.

Effect of Peppermint and Ginger Aromatherapy on Nausea and Vomiting in Breast Cancer Patients, measured 30 minutes before chemotherapy, 2 hours and 6 hours after chemotherapy.

Time (Beginning)	Time (End)	Mean Difference (Beginning - End)	Sig.(P Value)	95% Confidence Interval for Difference	
				Lower	Upper
P1	P2	4.143 *	.000	3.876	4.409
	P3	13,429 *	.000	10,441	16,416
P2	P1	-4.143 *	.000	-4.409	-3.876
	P3	9.286 *	.000	6.288	12,283
P3	P1	-13,429 *	.000	-16,416	-10,441
	P2	-9.286 *	.000	-12,283	-6.288
G1	G2	4.214 *	.239	.000	3,559
	G3	8,071 *	.399	.000	6,977
G2	G1	-4.214 *	.239	.000	-4,869
	G3	3.857 *	.275	.000	3.103
G3	G1	-8,071 *	.399	.000	-9.166
	G2	-3.857 *	.275	.000	-4.611

Information:

P1: Peppermint Aromatherapy Intervention was performed 30 Minutes Before Chemotherapy

P2: Peppermint Aromatherapy Intervention was performed 2 Hours After Chemotherapy

P3: Peppermint Aromatherapy Intervention Performed 6 Hours After Chemotherapy

G1: Ginger Aromatherapy Intervention Performed 30 Minutes Before Chemotherapy

G2: Ginger Aromatherapy Intervention Performed 2 Hours After Chemotherapy

G3: Ginger Aromatherapy Intervention Performed 6 Hours After Chemotherapy

Peppermint aromatherapy significantly reduced nausea and vomiting in breast cancer patients at three time points. The greatest decrease occurred 6 hours after chemotherapy was completed with a mean difference = 13.429 and p value = 0.000, followed by a decrease after 2 hours of chemotherapy with a mean difference = 9.286 and p value = 0.000. Significant changes were also seen between 30 minutes before and 2 hours after chemotherapy with a mean difference = 4.143 and p value = 0.000. Overall, peppermint aromatherapy was effective in reducing nausea and vomiting, especially after chemotherapy was completed. Ginger aromatherapy did not have a significant effect on nausea and vomiting in breast cancer patients, with a p-value greater than 0.05 at all measurement time points. Although there was a decrease, the change was not significant. Compared with peppermint aromatherapy, which showed significant results, ginger aromatherapy was less effective in reducing nausea and vomiting during chemotherapy. The results of the analysis showed that although there was a decrease in nausea and vomiting symptoms after ginger aromatherapy, the change was not statistically significant (p-value > 0.05). The comparison between 30 minutes before chemotherapy and 2 hours after chemotherapy resulted in a mean difference = 4.214 and a p value = 0.239, between 30 minutes before chemotherapy and 6 hours after chemotherapy resulted in a mean difference = 8.071 and a p value = 0.399, and between 2 hours and 6 hours after chemotherapy resulted in a mean difference = 3.857 and a p value = 0.275. 75. Ginger has strong antiemetic properties, but its effects take longer to show or depend on the individual's sensitivity to aromatherapy. However, ginger aromatherapy has not been effective enough to show significant reductions in nausea and vomiting in shorter periods after chemotherapy. In contrast, peppermint aromatherapy was shown to be more effective in relieving nausea and vomiting in breast cancer patients, with a faster and more significant effect. The researchers suggest further research with a larger sample size, and considering the combination of ginger therapy with other therapies, such as antiemetic drugs, and psychological factors that influence response to therapy. Further research is needed on the

optimal dose and duration of ginger aromatherapy use for chemotherapy symptom management.

CONCLUSION

Breast cancer patients at Husada Hospital Jakarta were on average 47 years old with mild anxiety. Peppermint aromatherapy significantly reduced nausea and vomiting at three measurement time points, while ginger showed no significant reduction. Therefore, peppermint is more effective than ginger in reducing nausea and vomiting after chemotherapy.

REFERENCES

- Apfel, C. C., & Roewer, N. (2018). Management of nausea and vomiting in chemotherapy: An updated review. *Cancer Chemotherapy and Pharmacology*, 81 (4), 567-580.
- Brown, A.L. (2021). Comparative effectiveness of ginger and peppermint aromatherapy in the management of chemotherapy-induced nausea: A randomized pilot study. *Journal of Clinical Aromatherapy*, 10 (3), 45-59.
- Hasibuan, F., & Hasanah, N. (2021). Comparative study of peppermint and ginger aromatherapy for chemotherapy-induced nausea and vomiting in breast cancer patients. *Asian Journal of Nursing Education and Research*, 11 (1), 45-53.
- Hines, S. (2017). Aromatherapy for managing chemotherapy-induced nausea and vomiting: A clinical perspective. *Journal of Oncology Nursing*, 22 (3), 284-291.
- Ji Min Lee, K. (2017). Ginger and ppermint aromatherapy for reducing nausea and vomiting: A systematic review. *Integrative Cancer Therapies*, 16 (1), 32-40.
- Johnson, T. H. (2023). Efficacy of peppermint and ginger essential oils in reducing chemotherapy-induced nausea: A systematic review and meta-analysis. *International Journal of Oncology*, 39 (2), 112-127.
- Jones, M. K. (2019). Comparison of ginger and peppermint essential oils for the management of chemotherapy-induced nausea: A pilot study. *Journal of Alternative and Complementary Medicine*, 25 (8), 703-710.
- Kartikasari, R. (2017). The effect of peppermint aromatherapy on nausea and vomiting in breast cancer patients: A case study. *Journal of Oncology Nursing*, 13 (2), 98-105.
- Kim, J. H. (2017). Ginger and peppermint for chemotherapy-induced nausea: A systematic review. *Journal of Clinical Nursing*, 26 (13-14), 2020-2028.
- Ministry of Health of the Republic of Indonesia. (2019). *Indonesian Health Profile 2019*. Ministry of Health of the Republic of Indonesia.
- Lee, K. N. (2022). Aromatherapy with peppermint and ginger oils for the relief of chemotherapy-induced nausea and vomiting: A comparative study. *Cancer Therapy and Pharmacology*, 11 (5), 218-225.
- Martin, L. R. (2020). The impact of ginger and peppermint aromatherapy on chemotherapy-induced nausea in breast cancer patients: A randomized clinical trial. *Journal of Cancer Care*, 27 (7), 1591-1597.
- Masruroh, H., & Wulan, S. (2021). Evaluation of the effectiveness of peppermint and ginger aromatherapy in reducing nausea and vomiting in breast cancer patients . *Journal of Oncology*, 22 (2), 88-96.
- Smith, H. J. (2021). The efficacy of peppermint and ginger aromatherapy in reducing chemotherapy-induced nausea and vomiting in breast cancer patients. *Journal of Oncology Nursing*, 38 (2), 96-102.
- Wilson, C.F. (2024). Exploring the benefits of aromatherapy: Peppermint vs. ginger essential oils for chemotherapy-induced nausea in breast cancer patients. *Aromatherapy Research Journal*, 13 (1), 85-95.