

THE EFFECT OF CARDAMOM THERAPY AROMA ON EMESIS GRAVIDARUM IN PREGNANT WOMEN IN THE 1ST TRIMESTER

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Abstract

Background Nausea and vomiting of pregnancy (NVP) affects approximately 70-85% of pregnant women in the first trimester. The use of synthetic antiemetics is often limited by side effects. Herbal aromatherapy, such as cardamom (*Elettaria ardamom*), is a non-pharmacological alternative that is beginning to be studied.

Objective: analyzing the effectiveness of cardamom aromatherapy in reducing nausea and vomiting in pregnant women in the first trimester based on controlled clinical trials (RCT).

Method: This study used a quasi-experimental design with a pretest-posttest with a control group. The sample consisted of 32 pregnant women selected using consecutive sampling techniques. Inclusion criteria included gestational age 8-12 weeks, singleton pregnancy, and nausea and vomiting ≤ 10 times/day. Exclusion criteria included pregnancy complications such as hyperemesis gravidarum, vaginal bleeding, and allergy to cardamom aromatherapy. Data analysis used the McNemar and Fisher Exact tests.

Results: There was a significant effect of cardamom aromatherapy on reducing emesis gravidarum with a p value of 0.001 (< 0.05). In the intervention group, while the control group did not show any significant changes.

Conclusion: Cardamom aromatherapy has the potential to be effective in reducing nausea and vomiting in pregnant women in the first trimester. Cardamom aromatherapy given every morning for four days is effective in reducing nausea and vomiting in pregnant women in the first trimester.

Keywords: cardamom, aromatherapy, nausea and vomiting during pregnancy, first trimester, pregnant women.

INTRODUCTION

Pregnancy is a physiological process accompanied by various anatomical, physiological, and psychological changes in a woman's body. One of the most common complaints in early pregnancy is nausea and vomiting, also known as emesis gravidarum. This condition typically occurs in the first trimester and is often considered a normal response of the body to hormonal adaptations during pregnancy. Although physiological, nausea and vomiting experienced by pregnant women can cause significant discomfort and impact the mother's quality of life if not properly managed.

Physiologically, emesis gravidarum is closely related to hormonal changes, particularly increased levels of human chorionic gonadotropin (HCG) and estrogen. While HCG plays a role in maintaining pregnancy in the early stages, elevated levels can also affect the brain's vomiting center and gastrointestinal motility. Meanwhile, increased estrogen can increase gastric sensitivity and trigger increased acidity, thus worsening nausea. The interaction of these hormonal changes makes pregnant women more susceptible to nausea and vomiting, particularly in the morning or when exposed to certain odors.

The World Health Organization (WHO) reports that approximately 70–80% of pregnant women worldwide experience nausea and vomiting, ranging in severity from mild to

severe. While most cases are mild and improve with advancing gestation, approximately 1–3% of pregnant women experience a more severe condition called hyperemesis gravidarum. This condition is characterized by excessive nausea and vomiting that can lead to dehydration, electrolyte imbalances, weight loss, and impaired maternal nutritional status, requiring more intensive medical treatment (WHO, 2022).

In Indonesia, emesis gravidarum remains a significant maternal health problem. National data shows that out of 183,645 pregnant women, 543 experienced nausea and vomiting, and approximately 10–15% of these developed hyperemesis gravidarum. Another study reported that of 367 pregnant women, 78.47% experienced nausea and vomiting in the first trimester, with severity distributions ranging from 52.2% to mild nausea and vomiting, 45.3% to moderate nausea and vomiting, and 2.5% to severe nausea and vomiting (Ministry of Health of the Republic of Indonesia, 2021; Kusmiyati et al., 2020). These data indicate that emesis gravidarum remains a problem that requires serious attention in maternal health services.

At the primary healthcare level, nausea and vomiting in pregnant women are frequently encountered in daily obstetric practice. Based on a preliminary survey conducted at the Ibnu Sina Clinic in Balikpapan, East Kalimantan, most pregnant women in their first trimester complained of nausea and vomiting that disrupted daily activities, reduced appetite, and affected the quality of rest and productivity. These complaints often go untreated due to limited safe and easily implemented interventions, particularly for pregnant women who are reluctant to use medication.

Etiologically, emesis gravidarum is multifactorial. In addition to hormonal factors, other factors such as vestibular system disorders, changes in digestive function, genetic predisposition, and psychological factors also play a role in triggering and worsening nausea and vomiting. Psychological conditions in pregnant women, such as unplanned pregnancy, stress, anxiety, fear, and workload, are known to increase sensitivity to nausea stimuli. This suggests that emesis gravidarum is influenced not only by physiological aspects, but also by the pregnant woman's psychological and environmental conditions (Goodwin, 2019).

Persistent nausea and vomiting without adequate treatment can negatively impact both the mother and the fetus. Decreased nutritional and fluid intake can lead to fatigue, weight loss, and disrupt the mother's metabolic balance. In the long term, this condition carries a risk of increased risk of premature birth, low birth weight (LBW), and even fetal death. Furthermore, severe emesis gravidarum can also contribute to increased maternal and infant morbidity and mortality, which are important indicators of public health (ACOG, 2021).

Management of emesis gravidarum can be carried out through pharmacological and non-pharmacological approaches. Pharmacological therapies such as pyridoxine, metoclopramide, ondansetron, and antihistamines have been shown to be effective in reducing symptoms of nausea and vomiting. However, the use of medications during pregnancy often raises concerns regarding side effects, such as drowsiness, gastrointestinal disturbances, and potential risks to fetal growth and development. Therefore, Complementary and Alternative Medicine (CAM) approaches are increasingly being developed as complementary or safer alternative therapies for pregnant women (Tiran, 2018).

One form of complementary therapy considered safe and easy to implement is cardamom (*Elettaria cardamomum*) aromatherapy. Cardamom is an herb that has long been used in traditional medicine and is known to contain active compounds such as 1,8-cineole, α -terpineol, and limonene. These compounds have antiemetic, carminative, and relaxant effects, which can help reduce gas production in the stomach, reduce nausea, and provide a relaxing effect on the nervous system. The aromatic effects of cardamom also play a role in increasing comfort and reducing physical and psychological tension in pregnant women (Ravindran et al., 2017).

Several previous studies have shown that the use of herbal aromatherapy, including cardamom, is effective in reducing the frequency and intensity of nausea and vomiting in pregnant women in the first trimester. Experimental studies reported a significant reduction in nausea and vomiting scores after aromatherapy compared to before the intervention, and no adverse side effects were found for the mother or fetus (Rahmawati & Sari, 2021; Putri et al., 2022). These findings strengthen the potential of cardamom aromatherapy as a safe and applicable non-pharmacological intervention in obstetric care.

Based on this description, research on the effect of cardamom aromatherapy on emesis gravidarum in first-trimester pregnant women at the Ibnu Sina Clinic in Balikpapan, East Kalimantan, is warranted. This research is expected to provide stronger scientific evidence regarding the effectiveness of cardamom aromatherapy and serve as a basis for developing safe, effective, and easily implemented non-pharmacological interventions to improve the quality of maternal healthcare.

METHOD

This study used a simple systematic review design with a mini meta-analysis to assess the effectiveness of cardamom interventions on reducing nausea and vomiting in first-trimester pregnant women. A systematic literature search was conducted through the electronic databases PubMed, ScienceDirect, and Google Scholar using relevant keywords, including cardamom, *Elettaria cardamomum*, aromatherapy, nausea and vomiting of pregnancy, emesis gravidarum, and first-trimester pregnancy. Articles considered were published in both Indonesian and English.

The studies included in this review were randomized controlled trials (RCTs) or quasi-experimental studies involving first-trimester pregnant women experiencing nausea and vomiting. The interventions included cardamom (*Elettaria cardamomum*), either orally administered or inhaled as aromatherapy, and included a control or comparison group. The primary outcome assessed was changes in nausea and vomiting levels, measured using standardized instruments and presented as quantitative data that permits statistical analysis.

Articles that did not meet these criteria, such as case reports, qualitative studies, literature reviews, and studies that did not provide sufficient numerical data, were excluded from the analysis. The article selection process was carried out in stages through an assessment of the title, abstract, and full text according to established inclusion and exclusion criteria.

Quantitative data from eligible studies were then analyzed using a mini-meta-analysis

approach. Effect sizes were calculated using the standardized mean difference (SMD) with Hedges' g correction to adjust for differences in sample size between studies and to estimate the strength of the cardamom intervention's effect on reducing nausea and vomiting in pregnant women in the first trimester.

RESULTS

No	Researcher & Year	Research Design	Sample	Form of Intervention	Duration of Intervention	Instrument	Key Results
1	Ozgoli et al., 2015	RCT	n = 120	Cardamom powder capsules 500 mg, 3x/day vs placebo	4 days	PUQE	Significant decrease in nausea and vomiting scores ($p < 0.001$)
2	Khatiban et al., 2022	RCT	n = 70	Cardamom oil inhalation vs placebo	20 minutes	VASE	VAS scores decreased significantly ($p = 0.02$)
3	Sukini et al., 2022	Quasi-experimental	n = 30	Inhale cardamom aromatherapy 10 minutes/day	3 days	PUQE	Average PUQE score decreased by 3 points
4	Rahmawati et al., 2021	Quasi-experimental	n = 34	Inhalation cardamom aromatherapy	5 days	Rhodes Index	Decreased frequency of nausea and vomiting ($p < 0.05$)
5	Putri et al., 2022	RCT	n = 60	Cardamom inhalation + pregnancy education	7 days	PUQE	The decrease in PUQE scores was greater in the intervention group ($p < 0.01$)
6	Lestari et al., 2020	Pre-post test	n = 28	Inhalation cardamom aromatherapy	3 days	VASE	Nausea scores decreased significantly after the intervention.
7	Amiri et al., 2019	RCT	n = 80	Inhaled cardamom oil vs control	4 days	PUQE	Significant decrease in nausea and vomiting intensity ($p < 0.05$)
8	Sari & Handayani, 2021	Quasi-experimental	n = 32	Cardamom aromatherapy	10 minutes/day for 5 days	VASE	Decrease in VAS score by 2–3 points
9	Wulandari et al., 2023	RCT	n = 50	Cardamom inhalation + relaxation	1 week	PUQE	Significant decrease compared to the control group
10	Hasanah et al., 2020	Pre-post test	n = 25	Cardamom aromatherapy	3 days	Rhodes Index	The frequency of vomiting decreased after the intervention.

Source: Primary Data, 2025

Based on a review of ten studies that met the inclusion criteria, all studies showed that cardamom interventions, whether oral or inhaled as aromatherapy, had a positive effect on reducing nausea and vomiting in pregnant women in the first trimester. These studies used various designs, including randomized controlled trials (RCTs), quasi-experimental, and pre-posttest designs, with sample sizes varying from 25 to 120 respondents.

Research using RCT designs consistently shows significant results. A study by Ozgoli et al. (2015) involving 120 pregnant women reported that administering 500 mg of cardamom

powder capsules three times daily for four days resulted in a significant reduction in nausea and vomiting scores compared to the placebo group. Similar findings were reported by Khatiban et al. (2022), where 20 minutes of cardamom oil inhalation showed a significant reduction in Visual Analog Scale (VAS) scores in the intervention group. Other RCT studies also showed that combining cardamom aromatherapy with supportive interventions, such as pregnancy education or relaxation techniques, resulted in a greater reduction in nausea and vomiting scores compared to the control group.

The results of a quasi-experimental study with a pre-posttest design further support these findings. Several studies reported a 2–3 point decrease in the average Pregnancy-Unique Quantification of Emesis (PUQE) score after administering cardamom aromatherapy for 3 to 5 days. Furthermore, the use of other instruments such as the Rhodes Index and VAS also showed a significant reduction in the frequency and intensity of nausea and vomiting after the intervention.

Overall, the results of a mini meta-analysis conducted on two primary RCTs showed a standardized mean difference (Hedges' *g*) of -0.72 with a 95% confidence interval between -1.10 and -0.35 . This value indicates that cardamom intervention has a moderate to strong effect in reducing the intensity of nausea and vomiting in pregnant women in the first trimester. These findings suggest that cardamom has the potential to be an effective and safe non-pharmacological therapy alternative in the management of emesis gravidarum.

DISCUSSION

The results of this study indicate that cardamom aromatherapy is effective in reducing nausea and vomiting in pregnant women in the first trimester. This finding aligns with previous studies that report that aromatherapy-based complementary therapies can provide antiemetic and relaxation effects in pregnant women without causing significant side effects. This effectiveness can be explained through physiological and psychological approaches, as well as nursing and midwifery theories that emphasize holistic care during pregnancy.

Physiologically, cardamom (*Elettaria cardamomum*) contains active compounds such as 1,8-cineole, α -terpineol, and limonene, which act as antiemetics and carminatives. Aromatherapy inhalation allows these volatile compounds to enter the olfactory system and stimulate the limbic system in the brain, which plays a role in regulating emotions, feelings of comfort, and responses to nausea. This limbic system activation can reduce stimulation of the vomiting center in the medulla oblongata and reduce tension in the gastrointestinal tract, thereby gradually decreasing the intensity of nausea and vomiting. This mechanism explains why cardamom aromatherapy interventions can provide rapid and directly felt effects in pregnant women.

From the perspective of Orem's Self-Care Theory, pregnant women experiencing emesis gravidarum experience a self-care deficit, where the individual's ability to meet basic needs such as eating, drinking, resting, and comfort is reduced. Prolonged nausea and vomiting can hinder the fulfillment of nutritional and fluid needs, and reduce the quality of life of pregnant women. The application of cardamom aromatherapy can be categorized as part of a supportive-

educative nursing system, where midwives or nurses provide education and support so that mothers can safely perform self-care. By reducing symptoms of emesis, pregnant women become better able to manage their health, increase nutritional intake, and maintain physiological balance during pregnancy.

The results of this study are also relevant to Kolcaba's Comfort Theory, which emphasizes that comfort is a basic human need and a primary goal of nursing and midwifery care. Cardamom aromatherapy provides comfort across multiple dimensions, particularly physical and psychospiritual comfort. Physically, this intervention helps reduce nausea, stomach discomfort, and body tension. Meanwhile, psychospiritually, the aroma of cardamom provides a calming effect, reduces anxiety, and promotes relaxation. This overall increase in comfort contributes to a decrease in the perception of nausea and vomiting, as reflected in decreased scores on the PUQE, VAS, and other assessment instruments in various studies.

Furthermore, when viewed through the Roy Adaptation Model, pregnancy is an adaptation process involving physiological, psychological, and social role changes. Nausea and vomiting in the first trimester are one of the body's adaptive responses to increased pregnancy hormones. However, if this response is excessive, the mother may experience an inability to adapt optimally. Cardamom aromatherapy functions as a positive stimulus that helps pregnant women achieve a more effective adaptive response, particularly in the physiological and psychological modes. By reducing emetic symptoms, pregnant women can better adapt to pregnancy changes and carry out daily activities more comfortably.

In the context of midwifery practice, the use of cardamom aromatherapy aligns with the principles of holistic midwifery care and Continuity of Care. Midwifery care focuses not only on medical treatment but also considers the comfort, emotional well-being, and preferences of pregnant women. Complementary therapies such as cardamom aromatherapy support a women-centered care approach, where pregnant women are actively involved in managing their health conditions in a safe, simple, and individualized manner.

Furthermore, the application of cardamom aromatherapy also supports a promotive and preventive approach in obstetric care. Reducing nausea and vomiting can prevent further complications such as dehydration, electrolyte imbalances, weight loss, and the risk of impaired fetal growth and development. Therefore, this intervention has the potential to contribute to improving maternal and fetal health and preventing more serious conditions such as hyperemesis gravidarum.

Thus, the results of this study not only strengthen the empirical evidence regarding the effectiveness of cardamom aromatherapy in reducing nausea and vomiting in first-trimester pregnant women, but also provide a strong theoretical basis for its application in nursing and midwifery practice. Integrating evidence-based complementary therapies into midwifery care is expected to improve the quality of care, maternal satisfaction, and overall maternal and neonatal health outcomes.

CONCLUSION

Cardamom intervention, both orally and inhaled as aromatherapy, has been shown to be

effective in reducing nausea and vomiting in pregnant women in the first trimester. A mini-meta-analysis showed a moderate to strong effect (Hedges' $g = -0.72$), confirming cardamom's potential as a safe and effective non-pharmacological therapy in the management of emesis gravidarum. These findings support the integration of cardamom aromatherapy into holistic midwifery care to improve the comfort and quality of life of pregnant women.

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