

DEEP BREATHING RELAXATION AND LEMON AROMA THERAPY IN THE MANAGEMENT OF NAUSEA AND VOMITING DURING EARLY PREGNANCY: A CASE STUDY

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Abstract

Nausea and vomiting during early pregnancy are common conditions that may affect maternal comfort, nutritional intake, and quality of life. Nonpharmacological approaches are increasingly recommended as safe complementary therapies for managing these symptoms. Most previous studies have focused on single interventions, such as deep-breathing relaxation or aromatherapy, with limited evidence on their combined or synergistic effects. This study aimed to describe the implementation of a combination of deep-breathing relaxation and lemon aromatherapy for the management of nausea and vomiting during early pregnancy. A descriptive case study design was applied, involving two pregnant women in the first trimester with emesis gravidarum. The intervention among pregnant woman consisted of deep-breathing relaxation combined with the inhalation of lemon aromatherapy, administered once daily in the morning for five consecutive days with a duration of 15 minutes. Outcomes were evaluated using the Pregnancy-Unique Quantification of Emesis (PUQE-24) instrument, supported by clinical observation and participants' subjective reports. The results demonstrated a reduction in the intensity of nausea and vomiting in both participants, as indicated by a decrease in PUQE-24 scores from moderate to mild categories, accompanied by improved comfort and appetite. Participants also reported increased relaxation and reduced nausea frequency following the intervention. These findings suggest that the combination of deep breathing relaxation and lemon aromatherapy has potential as an effective and applicable complementary nonpharmacological strategy in maternal nursing care during early pregnancy. Further studies with larger samples and more rigorous designs are needed to confirm these findings, including collaboration with nutritionists to optimize dietary management.

Keywords: Deep breathing relaxation, early pregnancy, lemon aromatherapy, nausea and vomiting.

INTRODUCTION

Pregnancy is a physiological process accompanied by significant physical and psychological changes, so it is often seen as a complex adaptation phase for women (Rahmah, 2024). During pregnancy, there is an increase in the hormones estrogen, progesterone, and human chorionic gonadotropin (hCG) produced by the placenta (Astri, 2024). Increased hCG levels play a role in stimulating estrogen production and contribute to the occurrence of nausea and vomiting in early pregnancy, known as emesis gravidarum (Ayudia et al., 2022).

Globally, emesis gravidarum is still a significant maternal health problem. The increase in the number of cases from year to year, reported by the WHO, with a total of 152,376 pregnant women in 2022 (Mailinda & Futriani, 2024). In Indonesia, the 2023 Indonesian Health Survey shows that 27.4% of pregnant women experience complaints of vomiting or not wanting to eat, with the incidence rate in West Java Province of 17.1% (Kemenkes, 2023). In Cirebon Regency, the high number of pregnancy complications recorded in 2023 reflects the considerable burden of maternal health problems, while primary healthcare facilities serve as the first point of contact for pregnant women, making it a relevant setting to explore the applicability of complementary nonpharmacological interventions in routine maternal care (Cirebon Regency Health Office, 2023).

Nausea and vomiting in pregnancy are widespread complaints, especially in the first trimester, with prevalence reported to exceed 80% (Mangler et al., 2025). This condition not only causes physical discomfort but also affects the quality of life and the ability of pregnant women to perform daily activities (Wahyuni et al., 2024). In more severe degrees, emesis can develop into hyperemesis gravidarum that requires intensive medical treatment (Nelson-Piercy et al., 2024). Globally, the prevalence of hyperemesis gravidarum is reported to reach 12.5% of all pregnancies (Mutia & Harahap, 2024). In addition, recent research shows that pregnant women have diverse perceptions and concerns regarding therapy options, and actively seek management information that is considered safe and effective during pregnancy (Mangler et al., 2025).

The management of nausea and vomiting in pregnancy includes pharmacological and nonpharmacological approaches, with dietary and lifestyle modifications as first-line therapy. However, more than one-third of pregnant women experience clinically significant symptoms that require fluid and vitamin supplementation and antiemetic therapy. These pharmacological treatments include the combination of doxylamine–pyridoxine, which is recommended as a first-line therapy due to its efficacy and non-teratogenic profile (Fejzo et al., 2019; Nelson-Piercy et al., 2024). In cases of hyperemesis gravidarum, ondansetron is often utilized, although

its safety requires further study regarding gestational age (Fejzo et al., 2019; Nelson-Piercy et al., 2024). Furthermore, thiamine supplementation must be considered to prevent serious neurological complications, ensuring that pharmacological therapy is used selectively by balancing the benefits and risks for both the mother and fetus (Nelson-Piercy et al., 2024).

As concerns about the safety of therapy during pregnancy increase, complementary nonpharmacological approaches are increasingly being used to improve the comfort of pregnant women and minimize the potential for pharmacotherapy side effects (Wahyuni et al., 2023). Aromatherapy, acupressure, and herbal therapy are complementary forms of therapy that are commonly used in treating pregnancy nausea and vomiting (Wahyuni et al., 2023). Globally, herbal therapy use is reported to range from 12–82.3% among pregnant women, with ginger, peppermint, chamomile, lemon, and raspberry among the most commonly used herbs (Panchal et al., 2024).

The deep breathing relaxation technique is a simple, easy-to-apply nonpharmacological intervention and is reported to be effective in reducing the intensity of nausea and vomiting by increasing relaxation and decreasing the stress response (Nanda, 2022; Sahane & Weljale, 2020). In addition, lemon aromatherapy is more effective than ginger and peppermint in reducing nausea and vomiting during pregnancy (Barbara & Impuh, 2023; Rahmadhaniati et al., 2022). The use of aromatherapy via stick inhalers is considered practical because it is personal, portable, and does not spread scent into the surrounding environment (Heeney, 2016; W. Juliarti et al., 2024; Kusumawati & Prasetyorini, 2022).

The combination of deep breathing relaxation and lemon aromatherapy has the potential to provide a synergistic effect in increasing relaxation and reducing anxiety and intensity of nausea and vomiting in pregnant women. In nursing practice, nurses play an essential role in providing holistic care through safe, client-oriented nonpharmacological therapies. Therefore, this study aims to describe the application of the combination of deep breathing relaxation and lemon aromatherapy in the management of nausea and vomiting in early pregnancy in primary health services.

METHODS

This study used a qualitative approach with a case study design to describe the application of the combination of deep breathing relaxation and lemon aromatherapy in reducing nausea and vomiting in pregnant women with emesis gravidarum. This design was specifically chosen due to the limited existing evidence regarding the synergistic effects of combining these two nonpharmacological therapies. Furthermore, a case study approach allows

for a deeper understanding of how such interventions are practically implemented within real clinical settings, particularly in primary health services where nurses play a pivotal role in holistic care.

The research was conducted in the working area of the Plumbon Health Center in Cirebon Regency. The study subjects were two primigravida pregnant women who experienced emesis gravidarum and were selected by purposive sampling based on the following inclusion criteria: pregnant women who experienced nausea and vomiting at the beginning of pregnancy and were willing to participate. Participants were recruited through the health center's maternal registry and daily clinical visits. The researchers then conducted a screening process based on the criteria and provided a comprehensive explanation regarding the study's objectives, procedures, and benefits. Once the participants expressed their understanding and willingness to participate, informed consent was completed through the signing of formal consent forms prior to the intervention. Exclusion criteria included a history of sensitivity or allergy to lemon scent.

The intervention consisted of deep-breathing relaxation techniques combined with lemon aromatherapy via inhalation with stick inhalers. The intervention was carried out once every morning before activity, with a total duration of 15 minutes, consisting of deep-breathing relaxation for 5 minutes and lemon aromatherapy inhalation for 10 minutes, for five consecutive days. This study was conducted in May 2026. Data collection was carried out through interviews, observations, and physical examinations.

The level of nausea and vomiting was measured using the Pregnancy-Unique Quantification of Emesis and Nausea (PUQE-24) instrument (Einarson et al., 2013). This instrument has been standardized and translated into Indonesian, and it was used by the authors to assess symptoms over the previous 24 hours. To ensure validity and reliability, the study utilized the Indonesian version which has been widely adopted in maternal research. The PUQE-24 consists of three specific items: the duration of nausea per day, the frequency of vomiting episodes, and the frequency of retching or dry heaves. Each item is scored on a scale of 1 to 5, and the total score (ranging from 3 to 15) is analyzed to categorize the severity of emesis gravidarum as mild (score ≤ 6), moderate (7–12), or severe (≥ 13). Data were analyzed qualitatively, using a descriptive approach to compare participants' conditions before and after the intervention. This qualitative analysis followed the framework for descriptive case studies to provide a detailed and contextual exploration of the participants' experiences (Creswell, 2009; Judijanto et al., 2024).

This research was conducted in accordance with ethical research principles, including obtaining informed consent, ensuring data confidentiality, and respecting participants' rights. These principles were strictly implemented by anonymizing participant identities through the use of initials and ensuring that all interview transcripts and clinical records were stored in a secure, password-protected digital environment to prevent unauthorized access. This research received ethical approval from the Health Research Ethics Commission (KEPK) of the Ministry of Health of Tasikmalaya with Number: 0035213278211112025042600173.

RESULTS

A combination of deep-breathing relaxation and lemon aromatherapy was provided to two pregnant women in the first trimester with emesis gravidarum in the working area of the Plumbon Health Center, Cirebon Regency. The intervention was carried out for five consecutive days, once every morning, with self-repetition when nausea appeared. The findings of this study integrated multiple data sources to provide a comprehensive evaluation of the intervention's impact. The PUQE-24 questionnaire served as the primary quantitative measure to track the severity of nausea and vomiting, showing a clinical shift from moderate to mild categories in both participants. To support these findings, physical examinations and clinical observations were utilized to monitor vital signs and physical stability, ensuring that the reduction in PUQE-24 scores was accompanied by stable physiological conditions and an absence of adverse reactions. Furthermore, in-depth interviews captured the qualitative essence of the participants' experiences, providing narratives on their increased sense of comfort, improved appetite, and psychological control over their symptoms following the intervention.

The baseline characteristics, clinical data, and intervention outcomes of the participants are summarized in Table 1.

Table 1. Participant Characteristics and Emesis Gravidarum Outcomes

Participant	Mrs. R	Mrs. S
Age / Education	23 years / Madrasah Aliyah	24 years / High School
Gravida / Gestational Age	G1P0A0 / 11 weeks	G1P0A0 / 9 weeks
Baseline Clinical data	BMI 24.5 kg/m ² , Hb 12.4 g/dL, Infection screening: Non-reactive	BMI 18.46 kg/m ² , Hb 11.0 g/dL, Infection screening: Non-reactive
Dominant Symptoms	Morning-noon nausea and vomiting, decreased appetite	Nausea and vomiting triggered by food, hypersalivation, decreased appetite

Pre-Intervention 24 Score	PUQE- 8 (Moderate)	8 (Moderate)
Post-Intervention 24 Score	PUQE- 3 (Mild)	4 (Mild)
Post-Intervention Outcomes	Vomiting stopped, mild nausea of short duration	Frequency and duration of nausea decreased, no recurrent vomiting

During the intervention, no side effects were found, and vital signs remained stable. Both respondents reported increased appetite, more regular nutritional intake, and a feeling of freshness and relaxation after therapy.

To highlight the qualitative approach of this case study, in-depth interviews were conducted to capture the participants' subjective experiences. Mrs. R stated, "After doing the deep breathing and smelling the lemon, my stomach feels much calmer. I feel fresher and I can finally eat a little without throwing up right away." Similarly, Mrs. S expressed a positive response regarding her sense of control over the symptoms, stating, "The lemon scent is very refreshing. It really helps me control the nausea when I smell food, and the breathing exercises make me feel much more relaxed." Participants were able to intervene independently, which increased their sense of control over their nausea and vomiting symptoms.

DISCUSSION

The application of a combination of deep-breathing relaxation techniques and lemon aromatherapy in two pregnant women in the first trimester resulted in clinical improvement, with a decrease in nausea and vomiting from moderate to mild, as measured by the PUQE-24 score. These findings reinforce the potential for relaxation-based nonpharmacological interventions and sensory stimulation as supportive therapies in managing emesis gravidarum during early pregnancy.

Emesis gravidarum is a physiological condition related to an increase in hormones such as hCG, estrogen, and progesterone. Increased hCG affects the vomiting center in the medulla oblongata and slows down gastric emptying, triggering nausea and vomiting (Astri, 2024; Ayudia et al., 2022). In addition to these physiological factors, psychological aspects also aggravate the condition, especially in primigravida mothers facing physical and emotional adaptation (Rahmah, 2024). In both respondents, nausea was triggered not only by physical conditions but also by sensory stimuli, indicating the involvement of psychoneurological responses.

The clinical improvement observed can be analyzed through a comprehensive integration of physiological and psychological mechanisms. Physiologically, deep-breathing relaxation techniques work by decreasing sympathetic nervous system activity and increasing parasympathetic dominance through the stimulation of the vagus nerve (Nanda, 2022). This stabilization of the autonomic nervous system triggers a relaxation response that effectively suppresses the vomiting center and slows down gastric dysrhythmia. These findings align with research by Sahane & Weljale (2020), which showed the effectiveness of deep-breath relaxation in reducing emesis intensity in primigravida mothers.

Psychologically, lemon aromatherapy provides sensory stimulation directly connected to the limbic system, the brain's center for emotion and memory regulation. The active constituent, limonene, has a refreshing and calming effect that can improve the mother's mood and divert her focus from distressing stimuli (Fitri & Yuliaswati, 2023). Several studies report that lemon aromatherapy is more effective than ginger or peppermint in reducing emesis intensity (Barbara & Impuh, 2023; Rahmadhaniati et al., 2022).

The combination of these two interventions in this study showed a synergistic effect. Deep breathing helps calm the physiological response, while lemon aromatherapy provides pleasant sensory stimulation and lowers stress. In line with Ardani & Hastuti (2025), such combined nonpharmacological interventions produce a more optimal clinical outcome than a single intervention. This synergistic effect was further supported by qualitative findings, where participants explicitly expressed an immediate sense of relief, freshness, and improved psychological control over their symptoms. Moreover, the use of a stick inhaler increased the practicality and effectiveness of the therapy as the scent is focused and can be used independently (Heeney, 2016; Widya Juliarti et al., 2024)

From a nursing perspective, these findings reinforce the role of nurses in providing holistic bio-psycho-socio-spiritual care through safe and easy-to-apply self-intervention strategies. However, this study has several limitations that should be acknowledged. First, the sample size is very small ($n=2$), which limits the generalizability of the findings. Second, as a descriptive case study without a control group, it is difficult to definitively distinguish the effects of the intervention from the natural progression of symptoms. These limitations underscore the need for more rigorous experimental research in the future.

CONCLUSION

The combination of deep-breathing relaxation and lemon aromatherapy effectively reduced nausea and vomiting in first-trimester pregnant women, shifting symptoms from moderate to mild categories. This intervention offers significant clinical value by empowering women with an independent, patient-centered strategy for symptom management in primary care settings. To validate these findings, future research should utilize more rigorous designs, such as Randomized Controlled Trials (RCTs) with larger samples. Furthermore, interprofessional collaboration, particularly with nutritionists is recommended to provide a more holistic management approach for emesis gravidarum.

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