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THE EFFECT OF LEMON AROMATHERAPY ON EMESIS GRAVIDARUM IN PREGNANT WOMEN IN THE 1ST TRIMESTER

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ABSTRACT

BackgroundEmesis gravidarum is a condition of nausea and vomiting that is often experienced by pregnant women during the first trimester and can affect nutritional status and quality of life. Lemon aromatherapy is known to have calming and antiemetic effects, but scientific evidence regarding its effectiveness in reducing emesis gravidarum is limited. **Objective**: This study was conducted to determine the effect of lemon aromatherapy on the level of emesis gravidarum in pregnant women in the first trimester. **Method**: The research design used was an experimental pretest–posttest with a control group. The sample consisted of 30 respondents, namely 15 pregnant women in the treatment group and 15 in the control group, which were determined through consecutive sampling techniques. The level of emesis gravidarum was measured using the PUQE-24 instrument. Analysis of changes before and after the intervention was carried out using the McNemar test, while comparisons between groups used the Fisher's Exact test due to the relatively small sample size. **Results**: The study results indicate that lemon aromatherapy significantly reduces the level of emesis gravidarum in pregnant women in the first trimester, as indicated by a p value of 0.001 ($p < 0.05$). Administering lemon aromatherapy every morning for 7 days has been shown to be effective in reducing nausea and vomiting in early pregnancy compared to the control group. **Conclusion**: Lemon aromatherapy has been proven effective as an alternative therapy in treating emesis gravidarum in pregnant women in the first trimester. This intervention can be recommended to health workers, especially midwives, as a non-pharmacological approach in treating symptoms of nausea and vomiting during pregnancy.

Keywords: lemon aromatherapy, emesis gravidarum, first trimester pregnant women

INTRODUCTION

Pregnancy is a physiological process experienced by most women and is characterized by various hormonal, physical, and psychological changes. Nausea and vomiting in the first trimester are often triggered by increased levels of the hormones human chorionic gonadotropin (hCG), estrogen, and progesterone, known as emesis gravidarum. Approximately 50–90% of pregnant women experience this condition early in pregnancy. Although considered physiological, these symptoms can disrupt comfort, reduce daily activity, reduce nutritional intake, and potentially lead to dehydration if not managed appropriately.

Pregnant women who are pregnant for the first time (primigravida) are reported to experience nausea and vomiting more frequently because their bodies are not yet accustomed to these hormonal changes. Research by Citra & Arwidiana (2023) reported the prevalence of emesis gravidarum in Indonesia reaching 50–80%, with a higher incidence in primigravida (60–80%) compared to multigravida (40–60%).

Emesis gravidarum is a complaint of nausea and vomiting in the first trimester, occurring no more than five times a day and is considered physiological. This condition is often accompanied by dizziness, weakness, and gastrointestinal discomfort. Research by Krisniyawati, Norhapifah, and Hadiningsih (2022) shows that approximately 60% of pregnant women experience emesis gravidarum in the first trimester, with varying degrees of severity. If left untreated, this condition can impact the mother's nutritional status, quality of life, and fetal health.

Various non-pharmacological methods are used to alleviate these symptoms, one of which is aromatherapy. Lemon (Citrus limon) aromatherapy contains the compound limonene, which provides a fresh scent and stimulates the limbic system, helping to relieve nausea. Several studies have shown that inhaling lemon aroma plays a role in reducing the intensity of nausea and vomiting and increasing comfort in pregnant women. It is easy to use, safe, and has minimal side effects. With this potential, lemon aromatherapy is a worthy complementary therapy alternative for managing emesis gravidarum in the first trimester.

Research on lemon aromatherapy is needed to provide scientific evidence for health workers, especially midwives, in providing educational education and carrying out appropriate interventions for pregnant women experiencing nausea and vomiting.

METHOD

This study was conducted using a quasi-experimental design with a pretest–posttest control group model and was implemented at the "Permata Bunda" TPMB, Jl. Negara, Sukaraja Village, Sepaku District, Penajam Paser Utara Regency, East Kalimantan, from October to November 2025. This study has obtained approval from the research site. The entire process was carried out in accordance with ethical principles, including providing informed consent, maintaining the confidentiality of participant identities, and ensuring voluntary participation.

The study sample consisted of 30 pregnant women in their first trimester recruited using consecutive sampling, which involved accepting all prospective respondents who met objective criteria sequentially throughout the study period until the sample size was reached, without any subjective selection process. Inclusion criteria included a gestational age of 8-12 weeks, a singleton pregnancy, and a frequency of nausea and vomiting of no more than 10 times per day (non-hyperemesis gravidarum). Exclusion criteria included pregnancy complications such as hyperemesis gravidarum, vaginal bleeding, medical conditions that could potentially affect gastrointestinal complaints, or a history of allergy to lemon essential oil.

The level of nausea and vomiting was assessed using the PUQE-24 (Pregnancy-Unique Quantification of Emesis and Nausea) instrument, which has been shown to have good validity and reliability in assessing the severity of emesis gravidarum (Hada et al., 2021). This study did not implement blinding procedures due to design limitations, but the implementation of the intervention was standardized to minimize potential bias.

The intervention was administered by dropping 2–4 drops of lemon essential oil onto cotton or tissue, which was then

inhaled by the respondents at a distance of ±3–5 cm from the nose in a relaxed sitting position. The inhalation process was carried out once daily every morning for 7 days. All procedures were carried out at the research location under the supervision of researchers to ensure consistency of implementation.

In this study, the independent variable was lemon aromatherapy, while the dependent variable was the level of nausea and vomiting, measured using the PUQE-24 instrument. Additionally, confounding variables considered included age, education level, employment status, and parity. These variables were controlled through uniformity of respondents' baseline characteristics and will be analyzed to reduce potential bias in the study results.

Changes before and after intervention in each group were analyzed using the McNemar test, while group comparisons used the Fisher Exact test. The McNemar test was chosen because the data were paired categorical, while the Fisher Exact test was chosen for intergroup comparisons because there were cells with frequencies <5.

RESULTS

The characteristics of respondents in this study are presented in the following table:

Table I. Respondent Characteristics

Characteristics	**Intervention Group**		**Control Group**	
Age	N	%	N	%
Risky	2	13.3	1	6.7
No risk	13	86.7	14	93.3
Education				
Elementary School	1	6.7	2	13.3
JUNIOR HIGH SCHOOL	2	13.3	3	20.0
SENIOR HIGH SCHOOL	5	33.3	8	53.3
D3	5	33.3	2	13.3
S1	2	13.3	–	–
Work				
Teacher	3	20.0	–	–
Employee	3	20.0	3	20.0
Self-employed	–	–	1	6.7
Housewife	9	60.0	11	73.3
Parity				
Primigravida	7	46.7	9	60.0
Multigravida	8	53.3	6	40.0
Total	15	100	15	100

Based on the pretest characteristics of the control group, the majority of respondents were in the moderate category, with 8 people (53.3%), followed by the mild category, with 7 people (46.7%). This indicates that before the intervention, the majority of respondents were in moderate levels. Although the difference between the two categories was not very large, this distribution also illustrates that the initial conditions of the respondents were relatively balanced, but still dominated by the moderate group. Therefore, the pretest characteristics of the control group indicate

a respondent composition that tends towards the moderate level.

OnThe posttest results for the control group showed a change in the distribution of categories. Respondents with mild symptoms increased to 8 (53.3%), while those with moderate symptoms decreased to 7 (46.7%). This change indicates a shift in the respondents' condition. Although the control group did not receive intervention, the percentage change was still visible. This shift suggests other factors may be influencing the situation, but overall the distribution remained relatively balanced between the two groups. Thus, the posttest results show an increase in respondents with mild symptoms in the control group.

Table 2. Analysis of Gravidarum Emesis Levels Pre and Post Intervention

Emesis gravidarum	Pretest		Posttest		p-value
	N	%	N	%	
Treatment Group					
No vomiting / Mild	5	33.3	12	80.0	**0.016**
Currently	10	66.7	3	20.0	
Control Group					
No vomiting / Mild	3	20.0	9	60.0	**0.031**
Currently	12	80.0	6	40.0	

Based on Table 2, in the intervention group before being given lemon aromatherapy, the majority of respondents were in the moderate category, there were 10 respondents (66.7%) in the moderate category and 5 respondents (33.3%) in the non-vomiting/mild category. After being given the intervention, there was an increase in the number of respondents who experienced a decrease in symptoms, namely the majority of respondents in the non-vomiting/mild category including the non-vomiting/mild category dominating at 80.0%, while the moderate category was 20.0%. The McNemar test produced a p-value of 0.016 (<0.05), indicating a significant difference pre- and post-intervention.

Before the observation period, the control group was dominated by respondents in the moderate category, with 12 people (80.0%), while 3 people (20.0%) were in the no/mild vomiting category. After the observation period without intervention, there was a change in distribution, with 9 respondents (60.0%) in the no/mild vomiting category and 6 respondents (40.0%) in the moderate category. Although there was a shift in categories, the change was not as large as that in the intervention group. The McNemar test results showed a p-value of 0.031 (<0.05), indicating a significant difference in the level of emesis gravidarum before and after observation in the control group.

Table 3. Impact of Lemon Aromatherapy on Emesis Gravidarum

Emesis gravidarum (Posttest)	Group				OR	p-value
	Intervention		Control			
	N	%	N	%		

No vomiting / Mild	12	80.0	9	60.0	2,667	**0.001**
Currently	3	20.0	6	40.0		

Based on the table, the majority of respondents in the intervention group, 12 (80.0%), fell into the mild/no vomiting category. Meanwhile, only 3 (20.0%) experienced moderate symptoms. This indicates that after receiving lemon aromatherapy, the majority of respondents experienced milder symptoms.

In the control group, it was seen that the proportion of respondents with the no vomiting/mild category was lower than the intervention group, namely only 9 respondents (60.0%) in the no vomiting/mild category were in the no vomiting/mild category, while the moderate category was 6 respondents (40.0%). The results of the Fisher's Exact test showed a p value = 0.001 (<0.05), which indicated a significant difference between the intervention group and the control group in the post-test results. The OR value = 2.667 indicated that respondents in the intervention group had approximately 2.7 times greater chance of being in the no vomiting/mild category than the control group.

DISCUSSION

1. Age

The analysis indicates that most respondents are in the safe reproductive age group, 20–35 years old. This age is the most ideal for a woman to become pregnant because reproductive organ function has developed optimally. In this age range, the risk of complications tends to be lower compared to those under 20 and over 35 years old. During adolescence, reproductive organ immaturity and psychological factors can affect comfort during pregnancy. Meanwhile, at age 35 and above, the body's adaptive capacity begins to decline, making it susceptible to various complaints.

Nausea and vomiting in those under 20 years of age can occur due to physical and mental unpreparedness, while in those over 35 years of age, it can be triggered by stress or an unplanned pregnancy. However, this study's findings indicate that age differences do not significantly impact the incidence of emesis gravidarum. This condition is more closely related to the hormonal changes experienced by pregnant women and the body's ability to adapt to these changes.

2. Education

The majority of respondents in this study had a secondary or higher education level. In general, education plays a role in shaping mindsets, the ability to absorb information, and health awareness. However, a high level of education does not guarantee that a pregnant woman will be free from emesis gravidarum. This complaint can still arise, as it is more influenced by physiological factors and the body's response to hormonal changes during pregnancy.

Every pregnant woman has a different perception of her pregnancy. This perception can influence how she responds to discomfort. Therefore, while education can increase knowledge, it doesn't necessarily eliminate the possibility of nausea and vomiting during pregnancy.

3. Job

The majority of respondents in this study did not work outside the home. In theory, employment can influence the stress levels experienced by pregnant women. Working mothers tend to face dual demands—

workload and household responsibilities—which can lead to fatigue and emotional tension. This condition can potentially exacerbate nausea and vomiting.

However, mothers who do not work are not necessarily at risk of emesis gravidarum. Home environmental factors, family support, daily routines, and psychological well-being can still influence the symptoms that arise. This study shows that employment status is not significantly associated with the severity of emesis gravidarum, as this symptom is predominantly triggered by physiological changes.

4. Parity

Research results show that the incidence of emesis gravidarum is relatively equal between primigravida and multigravida mothers. Some literature suggests that primigravida are more susceptible to nausea and vomiting because their bodies are experiencing hormonal changes and adapting to pregnancy for the first time. Conversely, multigravida mothers are considered better prepared due to their experience from previous pregnancies.

However, the results of this study found no significant differences between the two groups. This indicates that the severity of emesis gravidarum is influenced not only by previous pregnancy experiences but also by the individual's physiological condition and the body's response to changes in hCG and estrogen hormones.

5. The Effect of Lemon Aromatherapy on Emesis Gravidarum

Lemon aromatherapy has been shown to significantly reduce the incidence of emesis gravidarum. These results are consistent with several studies that suggest lemon aroma plays a role in relieving nausea and vomiting in pregnant women.

Lemon essential oil contains the key component limonene, which plays a key role as an antiemetic agent. Limonene is known to work by influencing the brain's limbic system, which regulates emotions, comfort, and the body's reactions to certain stimuli. Furthermore, limonene can suppress prostaglandin activity and inhibit the enzymes cyclooxygenase I and II, thereby reducing discomfort in the digestive tract.

Lemon aromatherapy is a safe complementary therapy to use during pregnancy due to its minimal side effects. Only a small number of individuals may experience mild allergic reactions, such as skin irritation. The inhalation method also allows for a more rapid onset of effects, as the essential oil molecules directly enter the respiratory tract and induce a relaxing response.

In this study, participants inhaled lemon scent drops onto cotton wool while sitting in a relaxed position for several minutes each morning for 7 days. Post-test results showed an increase in the number of respondents with mild symptoms and a decrease in the number of respondents experiencing moderate emesis. These findings were supported by McNemar and Fisher's exact tests, which indicated significant differences between pre- and post-intervention conditions and between groups.

Thus, lemon aromatherapy has been shown to have a therapeutic role in suppressing nausea and vomiting that occurs in early pregnancy. This intervention can be a simple, affordable, and safe alternative to help pregnant women cope with emesis gravidarum.

CONCLUSION

This study shows that in the first trimester of pregnancy, emesis gravidarum often occurs as a physiological response of the mother's body due to hormonal changes. This complaint can affect maternal comfort and nutritional intake. Inhaling lemon aromatherapy for 7 days has been shown to be effective in reducing the severity of nausea and vomiting based on the PUQE-24 score.

Statistical analysis results showed significant changes in the pre- and post-intervention conditions of the treatment group, as well as significant differences between the treatment and control groups. This suggests that lemon aromatherapy plays a role in reducing the symptoms of emesis gravidarum.

Respondent characteristics, namely age, education, occupation, and parity, did not show a strong association with the severity of nausea and vomiting. Symptom reduction was largely influenced by the aromatherapy intervention.

Overall, lemon aromatherapy can be recommended as a safe, affordable, and easy-to-implement complementary therapy option to help pregnant women relieve nausea and vomiting in the first trimester.

REFERENCE

Ahn, J. H., Kim, S. Y., & Park, M. J. (2024). Effects of aromatherapy on nausea and vomiting in patients with cancer: A systematic review and meta-analysis. Supportive Care in Cancer. Advance online publication.

Akyüz, A., & Kaya, T. (2021). The effect of lemon inhalation aromatherapy on nausea and vomiting during pregnancy. Complementary Therapies in Clinical Practice, 43, 101342.

Ayudia, P., & Ramadhani, N. (2020). Effectiveness of lemon aromatherapy on nausea and vomiting in pregnant women in the first trimester. Indonesian Midwifery Journal, 12(2), 78–85.

Badakhsh, M., Hashem-Dabaghian, F., & Ghods, R. (2020). A systematic review of aromatherapy in pregnancy. Journal of Obstetrics and Gynecology Research, 46(3), 480–492.

Citra, R., & Arwidiana, W. (2023). Prevalence of emesis gravidarum and influencing factors in pregnant women in the first trimester. Journal of Reproductive Health, 14(1), 22–30.

Ebrahimi, N., Maltepe, C., & Koren, G. (2010). Nausea and vomiting of pregnancy: Using the 24-hour PUQE. Canadian Journal of Obstetrics and Gynecology, 31(9), 803–807.

Ganong, L. H., & Coleman, M. (2021). Family health care nursing: Theory, practice, and research (7th ed.). F.A. Davis.

Hernandez, L.M., & Williams, D. (2020). Pregnancy-related nausea and vomiting: Pathophysiology and treatment strategies. Obstetrics & Gynecology Clinics, 47(1), 45–60.

Krisniyawati, N., Norhapifah, & Hadiningsih, S. (2022). The severity of emesis gravidarum in first trimester pregnant women. Indonesian Midwifery Journal, 10(1), 14–21.

Lee, M.S., & Shin, B.C. (2019). Aromatherapy for health care: An overview of systematic reviews. Maturity, 134, 29–36.

Lim, C., & Lee, J. (2020). Essential oil

therapy in women's health. Journal of Alternative and Complementary Medicine, 26(4), 320–329.

Mangesi, L., & Hofmeyr, G. J. (2019). Nausea and vomiting in early pregnancy. BMJ Clinical Evidence, 2019, 1403.

Nuraini, S., & Fauziah, R. (2021). Predisposing factors for emesis gravidarum in pregnant women. Journal of Midwives, 8(2), 56–64.

Ozgoli, G., &Saei Ghare Naz, M. (2018). Complementary and alternative therapies for nausea and vomiting in pregnancy. Iranian Journal of Nursing and Midwifery Research, 23(1), 1–10.

Pujiati, N., & Lestari, S. (2022). The effect of lemon aromatherapy on reducing the frequency of nausea and vomiting. Journal of Healthy Midwifery, 6(3), 112–119.

Rahmah, F., & Sari, N. (2021). The relationship between parity and maternal age and emesis gravidarum. Journal of Obstetrics, 7(1), 44–51.

Sari, NP, Lestari, D., & Widodo, S. (2022). Age and risk of complications in pregnancy. Journal of Public Health, 17(2), 89–96.

Savitri, D. (2020). The use of essential oils in treating nausea and vomiting during pregnancy. Indonesian Aromatherapy Journal, 3(1), 20–28.

Smith, C.A., Collins, C.T., & Crowther, C.A. (2020). Aromatherapy for nausea and vomiting in pregnancy. Cochrane Database of Systematic Reviews, 3, CD007575.

Widyastuti, M., & Handayani, W. (2021). The effect of lemon aromatherapy on the level of nausea and vomiting in first trimester pregnant women. Journal of Midwifery and Health, 12(1), 55–63.

World Health Organization. (2016). WHO recommendations on antenatal care for a positive pregnancy experience. WHO Pres