



# JNK

JURNAL NERS DAN KEBIDANAN  
(JOURNAL OF NERS AND MIDWIFERY)

<http://jnk.phb.ac.id/index.php/jnk>



## Lemon Aromatherapy Affected the Emesis Gravidarum in First Trimester Pregnancy



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### Article Information

#### History Article:

Received, 30/06/2023

Accepted, 11/08/2023

Published, 30/08/2023

#### Keywords:

lemon aromatherapy,  
emesis gravidarum, first  
trimester of pregnancy

### Abstract

Emesis occurs in 60-80% of primigravida and 40-60% of multigravida. These symptoms become more severe in one hundred out of a thousand pregnancies. The feeling of nausea is caused by an increase in estrogen and HCG hormone levels in the serum. 40% of women have used lemon scent to alleviate nausea and vomiting, and 25% of them have acknowledged that citrus aromatherapy is an effective way to control these symptoms. This study was aimed to determine the effectiveness of lemon aromatherapy in reducing emesis gravidarum in the first trimester of pregnancy. The method used a literature review. Research articles were searched using Google Scholar by entering the keywords "Lemon Aromatherapy," "Emesis Gravidarum," and "First Trimester Pregnant Women" from 2019 to 2023. Out of 15 published journals identified from 2019 to 2023, 10 journals met the criteria. Based on the 10 reviewed journals, lemon aromatherapy had been proven effective in reducing nausea and vomiting in the first trimester of pregnancy. Based on the results of the literature review, the administration of 2-3 drops of lemon aromatherapy for 5 minutes once a day for one week is effective in reducing the frequency of nausea and vomiting in the first trimester of pregnancy.

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P-ISSN : 2355-052X

E-ISSN : 2548-3811

## INTRODUCTION

The discomfort experienced by every pregnant woman varies during each trimester of pregnancy. One common complaint during pregnancy is nausea and vomiting, also known as morning sickness. (Yustina, 2020)

According to the World Health Organization (WHO) in 2015, there were 216 maternal deaths per 100,000 Live births due to complications of pregnancy and childbirth, while the total number of maternal deaths was estimated to reach 303,000 deaths worldwide.

According to the 2018 National Health Survey (Rikesdas) report on the disorders/complications experienced by mothers during pregnancy, among them are: 20% of mothers experienced continuous vomiting/ diarrhea, 2.4% had a high fever, 3.3% had hypertension, 0.9% experienced reduced fetal movement, 2.6% had bleeding in the birth canal, 2.7% had leakage of amniotic fluid and swollen feet accompanied by seizures, 2.3% had prolonged cough, 1.6% experienced chest pain/rapid, heartbeat, and 7.2% had other disorders/complications. (Fitria et al, 2021)

Nausea and vomiting during pregnancy have significant impacts on family life, social functioning, maternal fatigue, nutritional disturbances, dehydration, weakness, weight loss, and electrolyte imbalance. (Ginting & Melinda, 2022)

Continual nausea and vomiting can lead to reduced body fluids, resulting in thickened blood (hemoconcentration) and delayed blood circulation to tissues. This can cause tissue damage that can interfere with the health of the mother and the development of the fetus. (Widatiningsih et al., 2019)

Lemon aromatherapy contains components that can kill meningococcal bacteria, and typhoid

bacteria, have antifungal effects, and are effective in neutralizing unpleasant odors. Additionally, lemon aromatherapy also has anti-anxiety, antidepressant, and stress-relieving effects, as well as helping to uplift and focus the mind. (Y. Putri & Situmorang, 2020)

Aromatherapy is a therapeutic practice that involves using essential oils to improve physical and psychological well-being. When essential oils are inhaled, the molecules enter the nasal cavity and stimulate the limbic system in the brain. The limbic system is the area that influences emotions and memory and is directly connected to the adrenal glands, pituitary gland, hypothalamus, and other parts of the body that regulate heart rate, blood pressure, stress, memory, hormone balance, and respiration. (Santi, 2013)

## METHODS

This scientific paper utilized the Literature Review method. The search for relevant articles was conducted using Google Scholar by entering the keywords "Aromatherapy Lemon," "Emesis Gravidarum," and "First Trimester Pregnant Women" from the years 2019- 2023. A total of 15 journals were obtained. From these 15 journals, the researchers selected 10 journals that met the inclusion and exclusion criteria.

## RESULTS

Based on the result of the literature review conducted on 10 journals from 2019-2023, the author found that all 10 journals showed the influence of lemon aromatherapy in reducing nausea and vomiting in pregnant women in the first trimester.

No	Author's names and publication years	Article titles	Methods	Population and sample	Result
1.	(R. D. Putri et al., 2022)	"Giving Aromatherapy Combination Of Lemon And Peppermint Affects The Intensity Of Nausea And Vomiting In Pregnant Women In Trimester I"	Quantitative with a quasi-experimental design involving two groups, pretest, and posttest.	30 pregnant women in their first trimester experiencing nausea and vomiting.	There is an influence of administering a combination of lemon and peppermint aromatherapy on the intensity of nausea and vomiting in first-trimester pregnant women in the working area of Paduan Rajawali Community Health Center, Tulang Bawang Regency, in 2021, with a p-value of 0.001.
2.	(Yusnia et al., 2023)	"The Application of Lemon Aromatherapy Inhalation on Nausea and Vomiting (Emesis Gravidarum) in First Trimester Pregnant Women in the Working Area of Ganjar Agung Community Health Center, Metro City, in 2022"	Design of the scientific paper, using a case study method	Two first-trimester pregnant women experiencing nausea and vomiting.	The results of the application showed that after implementing lemon aromatherapy inhalation, there was a decrease in the PUQE- 24 scores, indicating a shift from the moderate category of nausea and vomiting to mild.
3.	(Fitria et al., 2021)	"The Influence of Lemon Aromatherapy on First Trimester Morning Sickness."	Pre- Experimental Design with One Group Pre-test and Post-test format.	15 pregnant women in the first trimester experiencing nausea and vomiting	There is a reduction in the frequency of first-trimester emesis gravidarum with the administration of Lemon Aromatherapy
4.	(Kresna Wati et al., 2021)	Pre-experiment	(one group pretest and posttest design).	30 first-trimester pregnant women who experience nausea and vomiting	The results of the study obtained an average pretest value of 7.97 and post-test 5 of .7 with an average decrease in the nausea vomiting scale of 2.3, statistical tests obtained the t value of nausea vomiting = 6.643 and p = 0.000, where p
5.	(Mathoriyah, 2019)	"Effect of Acupressure with Lemon Aromatherapy on Emesis Gravidarum in Pregnant Women First Trimester"	Pre- experiment with one group-post test design	Pre-post	Research results: average nausea and vomiting before the pre- post-test aromatherapist trimester average nausea and vomiting after being given lemon aromatherapy. There is an effect of lemon aromatherapy on emesis gravidarum in pregnant women TM 1 at Wonogiri Health Center with a p-value of 0.000

No	Author's names and publication years	Article titles	Methods	Population and sample	Result
6.	(yustina 2020, 2020)	The Effect of Electric Lemon Therapy on Nausea and Vomiting in First Trimester Pregnant Women"	Quasi experimental one group pretest posttest.	15 first trimester pregnant women who experience nausea and vomiting	The results of statistical tests using paired T-test tested the average value before was 5.27 and after 3.27. The average difference before and after being given electric lemon aromatherapy is 2.000 with a p-value. 005 < p = 0.05 There is an effect of giving electric lemon aromatherapy
7.	(Ginting & Melinda, 2022)	"The Effect of Lemon Aromatherapy in Reducing Emesis Gravidarum in 1st Trimester Pregnant Women"	Pre- experiment using Pre-Post Test approach	20 first trimester pregnant women who experience nausea and vomiting	The results of the paired T-test have a p-value of 0.000 when compared with $\alpha = 0.05$ , then the value shows the p-value < $\alpha$ , so it can be concluded that $H_a$ is accepted and $H_o$ is rejected. There is an effect of lemon therapy on emesis gravidarum in 1 <sup>st</sup> -trimester prof Nancy.
8.	(Y. Putri & Situmorang, 2020)	"The Effectiveness of Lemon Aromatherapy on Reducing the Frequency of Emesis Gravidarum in First Trimester Pregnant Women at Bpm Indra Iswari, Sst, Skm, Mm Bengkulu City"	Pre- experimental with Group Pre- Post Test Design.	mothers who come for ANC visits at BPM Indra Iswari, SST, SKM, MM.	Calculation result Statistics using the Wilcoxon Sign Rank Test as presented in Table 5.4 obtained a p-value of 0.001 < $\alpha$ (0.05), meaning that there is an effect of Lemon aromatherapy on nausea and vomiting in mothers.
9.	(Nurulicha & Aisyah, 2019)	The Effect of Giving Lemon Inhalation on Reducing Nausea and Vomiting in First-Trimester Pregnant Women at Pmb Lestari Cileungsi Bogor Regency in 2019	Pre- experimental with Group Pre- Post Test Design.	22 first- trimester pregnant women who experience nausea and vomiting	The results of the analysis showed that there was no increase in nausea and vomiting (0b), and there was no persistent nausea and vomiting (0c). The result of the significance value of p=0.000 means that there is an effect. The study concludes that there is a decrease and there is an effect after giving lemon aromatherapy inhalation on nausea and vomiting in first-trimester pregnant women.

No	Author's names and publication years	Article titles	Methods	Population and sample	Result
10.	(Kusuma Wardani et al., 2019)	“The Effect of Essential Lemon on Emesis Gravidarum in First Trimester Mothers in Natar District, South Lampung Regency”	Pre- experimental with One Group Pre- Post-Test Design.	30 first-trimester pregnant women who experience nausea and vomiting	The statistical test results of the p-value are 0.000 ( $\alpha \leq 0.05$ ) and the effectiveness of giving essential lemon in overcoming the frequency of nausea and vomiting in first-trimester pregnant women is 6.133. There is an effect of essential lemon on Emesis Gravidarum in first-trimester mothers at PMB Siti Hajar SST in Natar District, South Lampung Regency in 2019.

## DISCUSSION

Lemon aromatherapy has ingredients that can kill meningococcus bacteria (meningococcus), and typhoid bacteria, has anti-fungal effects, and is effective for neutralizing unpleasant odors, as well as producing anti-anxiety, anti-depression, anti-stress effects, and lifting and focusing the mind. (Y. Putri & Situmorang, 2020). Based on the research conducted, the results indicate that there is an influence of lemon aromatherapy on pregnant women in the first trimester. This finding is consistent with the study by Septiwiarysi et al. (2022), which showed a paired T-test result with a p-value of 0.000 when compared to  $\alpha = 0.05$ . Thus, the p-value  $< \alpha$ , leading to the acceptance of the alternative hypothesis ( $H_a$ ) and the rejection of the null hypothesis ( $H_0$ ). In the study by Ratna Dewi Putri et al. (2022), it was found that there is an influence of a combination of lemon and peppermint aromatherapy on the intensity of nausea and vomiting in pregnant women during the first trimester, with a p-value of 0.001. Similarly, Aida Fitria et al. (2021) found a reduction in the frequency of first-trimester emesis gravidarum with the administration of lemon aromatherapy, and Lala Putriyaza et al. (2019) reported a decrease in the average severity of nausea and vomiting after the use of lemon aromatherapy. Both studies had p-values of 0.000. Furthermore, Puri Kresna Wati et al. (2021) observed a significant decrease in the scale of nausea and vomiting after lemon aromatherapy, with a p-value of 0.000. Yustina et al. (2020) also found a significant effect of electric lemon aromatherapy on reducing nausea and vomiting, with a p-value of 0.005. Yesi Putri et al. (2020) reported a p-value of 0.001, indicating a significant influence of lemon aromatherapy, while Nurulica et al. (2019) found a p-value of 0.000, indicating a significant effect on reducing nausea and vomiting. Psiari Kusuma et al. (2019) found a p-value of 0.000 and an effectiveness score of 6.133 for the use of lemon essential oil in managing the frequency of nausea and vomiting in the first trimester. In the study by Rika Yusnia et al. (2023), the application of inhalation aromatherapy with lemon resulted in a decrease in PUQE-24 scores, shifting from the moderate to mild category. Based on the findings from these 10 reviewed journals, the author's opinion is that while lemon aromatherapy may not completely resolve nausea and vomiting, it can still effectively reduce the frequency of these symptoms in pregnant women during the first trimester. When given lemon aromatherapy (citrus

lemon) for 5-10 minutes for 6 days can reduce maternal nausea and vomiting, because giving lemon aromatherapy can help individuals be able to control themselves when they feel like vomiting. The components of lemon aromatherapy (Citrus Lemon) include Vitamin C, antioxidants, potassium, folate, calcium, thiamin, niacin, B vitamins, phosphorus, bioflavonoids, limonene, linalool, and pantothenic acid. (Somoyani, 2018). In the study conducted by Aida Fitria et al. (2021), the intervention involved the administration of instant lemon aromatherapy in the form of essential oil, with 2-3 drops of lemon aromatherapy being placed on a tissue or small towel and inhaled for 5-10 minutes at 6:00 AM daily for one week. The results showed that the data followed a normal distribution, as indicated by Shapiro-Wilk tests with p-values of 0.153 ( $>0.05$ ) for the pre-test and 0.230 ( $>0.05$ ) for the post-test. Statistical analysis using a t-test at a 95% confidence level and  $\alpha = 0.05$  revealed a p-value of 0.000 ( $<0.05$ ), indicating the influence of lemon aromatherapy on emesis gravidarum in pregnant women during the first trimester at Klinik Bidan Rosita, Desa Pasar Senin, Jambi province in 2020. The study also showed a decrease in the level of emesis gravidarum, where out of 15 participants, one experienced mild emesis gravidarum with a score of 6 reduced to 3, 13 participants had their moderate emesis gravid arum scores of 7-12 reduced to mild emesis gravid arum scores of  $\leq 6$ , and one participant maintained a moderate level of emesis gravidarum. In the study by Septiwiarysi et al. (2022), the intervention involved placing a solution of 2-3 drops of lemon aromatherapy on a tissue and placing it on the respondent's chest. This process was performed for approximately 20 minutes, replacing the tissue every 10 minutes. The paired T-test resulted in a p-value of 0.000 when compared to  $\alpha = 0.05$ , indicating that the p-value  $< \alpha$ , leading to the acceptance of the alternative hypothesis ( $H_a$ ) and the rejection of the null hypothesis ( $H_0$ ). Rika Yusnia et al. (2023) conducted a study where the application of lemon aromatherapy for 5 minutes over 4 days resulted in a decrease in PUQE-24 scores, shifting from the category of moderate nausea and vomiting to mild. Mathoriyah et al (2019) administered 2 drops of lemon essential oil to a tissue, which the respondents inhaled for 3 breaths each time they felt nauseous. This intervention was performed three times a day for 4 days. The average severity of nausea and vomiting before the administration of lemon aromatherapy was

8.7, while the average severity after administration was 6.4. The study showed an influence of lemon aromatherapy on emesis gravidarum in pregnant women during the first trimester at Puskesmas Wonogiri, with a p-value of 0.000. Nurulicha et al. (2019) conducted an intervention involving inhalation aromatherapy with lemon for four consecutive days, performed by each respondent in their own homes. The procedure involved placing 2-3 drops of lemon essential oil on a tissue or cotton ball, inhaling the aromatherapy for three breaths, and repeating the process after 5-10 minutes if the mother still experienced nausea and vomiting. This was done until nausea and vomiting were no longer experienced in the morning. Out of the 10 reviewed journals, 5 of them described the equipment, materials, and required duration of the interventions. One journal only mentioned the duration of the study, while 4 journals did not specify the equipment, materials, and time required for implementation.

From the review of 10 journals, it was found that 5 journals described the equipment such as a small towel, tissue, or cotton, and then the materials needed such as 2-5 drops of lemon essential oil aromatherapy, and the required time which is 5-10 minutes for 4 days - 1 week, 1 journal only mentioned the duration of the study, and 4 journals did not specify the equipment, materials, and implementation time. Therefore, the author assumes that the administration of 2-3 drops of lemon aromatherapy for 5 minutes, once a day, for one week, is effective in reducing the frequency of nausea and vomiting in first-trimester pregnant women.

## CONCLUSION

When given lemon aromatherapy, nausea and vomiting cannot be completely resolved because giving lemon aromatherapy is one of the preventive measures, but based on the results of a review of giving lemon aromatherapy as much as 2-3 drops for 5 minutes which is done once a day in one week effectively reduces the frequency of nausea vomiting in first first-trimester women.

## SUGGESTION

With the literature review that has been done, it is hoped that this can be information and reference for the learning process and material that can be the basis for further research by trying various other aromatherapies to be more varied which are equally effective in reducing the frequency of nausea and vomiting in first-trimester pregnant women so that better results can be obtained.

## ACKNOWLEDGEMENT

The author would like to express the utmost gratitude to Bunda Auni Midwifery Academy for their full support throughout the process of writing this literature review. Special thanks are also extended to the supervisor for providing valuable input that has enhanced the quality of this writing.

## FUNDING

All authors collectively funded this research and supported by Bunda Auni Midwifery Academy.

## CONFLICTS OF INTEREST

The author declares no conflict of interest. Other than the authors, no external funders are involved in the manuscript writing and publication decision.

## AUTHOR CONTRIBUTIONS

Author 1 was responsible for coordinating the progress of writing, participating in the research implementation, and publishing the journal article. Authors 2, 3 and 4 contributed to the compilation of the report and journal publication.

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