



## The Effect of Administration of Lavender and Lemon Aromatherapy on Emesis Gravidarum

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### ABSTRACT

The incidence of hyperemesis gravidarum in Indonesia in 2015 was 1.5-3% of pregnant women. Prolonged and poorly treated nausea and vomiting can affect nutritional disorders, dehydration, weakness, weight loss, and electrolyte imbalances, if not treated immediately this nausea and vomiting can interfere with daily life, or better known as hyperemesis gravidarum. This study is to determine the effect of giving lavender and lemon aromatherapy on emesis gravidarum in TPMB R in 2022. This study used a type of quasi experiment with a two group pretest-posttest design. The population in this study were first and second trimester pregnant women at TPMB R with a total sample of 53 respondents. The sample of this study amounted to 30 people with purposive sampling technique, namely sampling based on exclusion and inclusion criteria. Bivariate analysis using the Paired T test. The average value of the level of emesis gravidarum before being given lavender aromatherapy (10.07) and the average level of emesis gravidarum after being given lavender aromatherapy (5.67) with a difference in the level of Emesis Gravidarum (4.40). The average level of Emesis Gravidarum before being given lemon aromatherapy (11.47) and the average level of emesis gravidarum after being given lemon aromatherapy (6.27) with a difference in emesis gravidarum (5.20). There is an effect of giving Lavender Aromatherapy on Emesis Gravidarum (p-Value 0.001) and there is an effect of giving lemon aromatherapy on Emesis Gravidarum (p-Value 0.000). There is no difference between giving lavender aromatherapy and lemon aromatherapy on Emesis Gravidarum because both have the same effectiveness. It is hoped that lavender aromatherapy and lemon aromatherapy can be used as alternative treatments to reduce nausea and vomiting in pregnant women that can be done at home.

Keywords: Aromatherapy, Emesis Gravidarum, Lavender, Lemon

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## INTRODUCTION

Pregnancy is an event that occurs in a woman, starting from the process of fertilization (conception) until the birth of a baby. This process causes physical, mental, and social changes that are influenced by several physical, psychological, environmental, socio-cultural and economic factors. The discomfort that often occurs in pregnant women, especially in the first trimester of pregnancy, is nausea and vomiting (Emesis Gravidarum).<sup>1</sup>

Nausea and vomiting are early signs of pregnancy that are commonly found in pregnant women. These early signs of pregnancy appear in the second or eighth week after fertilization. The incidence of hyperemesis gravidarum reaches 12.5% of the total number of pregnancies. Nausea and vomiting can disrupt and create fluid imbalances in kidney and liver tissue resulting in necrosis.<sup>2</sup>

Prolonged nausea and vomiting that is not treated properly can affect nutritional disorders, dehydration, weakness, weight loss, and electrolyte imbalances, if not treated immediately this nausea and vomiting can interfere with daily life, or better known as hyperemesis gravidarum.<sup>3</sup>

In Indonesia there are (50-90%) cases of emesis gravidarum experienced by pregnant women. The main cause of maternal mortality in Indonesia is not nausea and vomiting (emesis gravidarum), about 60-80% of primigravida and 40-60% of multigravida experience nausea and vomiting, but this symptom occurs more severely in only 1 in 1,000 pregnancies. The incidence of hyperemesis gravidarum in Indonesia in 2015 was 1.5-3% of pregnant women.<sup>4</sup>

Emesis gravidarum during pregnancy can be managed pharmacologically and non-pharmacologically. Pharmacological measures are given vitamin b6, antihistamines, phenothiazines, and metoclopramide, ondansetron, and corticosteroids. Non-pharmacological measures that can be taken are that mothers can be encouraged to eat often in small portions, acupuncture, and giving aromatherapy.<sup>5</sup>

The results of research conducted by Wardanni stated that from a total of 30 respondents, it was found that first trimester mothers who experienced nausea and vomiting before lemon essentials were seen using the Nausea, Vomiting, and Retching Index (INVR) obtained a minimum INVR value of 10 (moderate nausea - vomiting) and a maximum of 25 in the category of nausea - vomiting bad and average INVR value of 17.67 in the category of severe nausea - vomiting, it was concluded that there was an effect of lemon essentials on Emesis Gravidarum in first trimester mothers at PMB Siti Hajar SST in Natar, South Lampung Regency in 2019.<sup>3</sup>

While the lavender aromatherapy research conducted by Rosalina this study shows that there is an effect of giving lavender aromatherapy to reduce vomiting nausea in first trimester pregnant women in the Jambu Kulon Health Center area effective for reducing nausea vomiting in pregnant women at PMB Fauziah Hatta Palembang by using the paired T statistical test significant value in the

experimental group of p-value ( $<0.001 < \alpha (0.05)$ ). While in the control group the p-value ( $0.0205 > \alpha (0.05)$ ).

So it can be concluded that giving lavender aromatherapy is more significant than giving counseling to reduce nausea and vomiting. The results of the analysis using the Independent T test showed a significant difference in the reduction of nausea and vomiting in both groups ( $\rho = <0.001 < \alpha = 0.05$ ).<sup>6</sup>

Preliminary studies conducted by researchers at TPMB "R" found that out of 10 pregnant women who experienced emesis gravidarum as many as 7 people, so the purpose of this study was to determine the effect of giving lavender and lemon aromatherapy on emesis gravidarum at TPMBR Bogor Regency in 2023."

### METHOD

This type of research is a Quasi Experiment pretest-posttest design with control. The sampling technique in this study was purposive sampling by considering the inclusion criteria and exclusion criteria with a total sample of 30 respondents at TPMB "R" Cijeruk Bogor Regency West Java, carried out in July 2022. The research instrument used the Pregnancy Unique Quantification of Emesis and Nausea (PUQE)-24 scoring questionnaire sheet. Bivariate analysis using Paired T-Test.

### RESULTS

Table 1. Average Value of Pretest and Post Test Emesis Gravidarum Levels at TPMB R Bogor Regency in 2022

Emesis Gravidarum	n	Min	Max	Mean	Mean Difference	SD
<b>Lemon Aromatherapy</b>						
Pretest	15	8	12	10.07	4.40	1,387
PostTest		5	6	5.67		0.488
<b>Lemon Aromatherapy</b>						
Pretest	15	8	15	11.47	5.20	2,066
PostTest		4	10	6.27		1,751

Based on Table 1 in the Lavender aromatherapy group with the average score of emesis gravidarum before being given lavender aromatherapy is (10.07) and the average level of emesis gravidarum after being given lavender aromatherapy is (5.67) with a difference in the level of Emesis Gravidarum (4.40). in the Lemon Aromatherapy group the average score of emesis gravidarum before being given lemon aromatherapy was (11.47) and the average emesis gravidarum after being given lemon aromatherapy was (6.27) with a difference in emesis gravidarum (5.20).

Table 2 Effect of Lavender Aromatherapy on Emesis Gravidarum Pretest And Post Test at TPMB R Bogor Regency

Emesis Gravidarum Level	Lavender Group			
	Mean	Mean Difference	SD	p-Value
Pretest	10.07	4.40	1,387	0.001
PostTest	5.67		0.488	

Based on Table 2 in the lavender aromatherapy group, the p-value is 0.001 <0.05, meaning that there is an influence between lavender aromatherapy on the level of emesis gravidarum.

Table 3 Effect of Lemon Aromatherapy on Emesis Gravidarum Pretest and Post Test at TPMB R Bogor Regency

Emesis Gravidarum Level	Lemon Group			
	Mean	Mean Difference	SD	p-Value
Pretest	11.47	5.20	2,066	0,000
PostTest	6.27		1,751	

Based on Table 3 in the lemon aromatherapy group, the p-value is 0.000 <0.05, meaning that there is an influence between lemon aromatherapy on the level of emesis gravidarum.

## DISCUSSION

### 1. The average value of Emesis Gravidarum level in lavender aromatherapy group and lemon aromatherapy group.

The results of this study found that the average level of Emesis Gravidarum before being given lavender aromatherapy was (10.07) and the average level of Emesis Gravidarum after being given lavender aromatherapy was (5.67) with a difference in the level of Emesis Gravidarum (4.40). there was a significant decrease in the level of Emesis Gravidarum after being given lavender aromatherapy at TPMB R Bogor Regency in 2022.

This is in line with what was done by Rosalina 2019, this study shows that from the results of the analysis of 15 experimental group respondents, namely the provision of lavender aromatherapy for 3 days, a decrease of -5.27 was obtained. The results showed that the score of the questionnaire decreased from the score before lavender aromatherapy was given. After that, the average value for 3 days was taken and the results did not exceed the value before being given lavender aromatherapy. Based on the results of the analysis of 15 control group respondents, namely the provision of counseling on reducing nausea and vomiting, the results were -0.53 (1.55).<sup>6</sup>

Rizky's research 2022, showed that the results of pretests and posttests when given Lavender

Aromatherapy treatment, the average intensity of nausea and vomiting before treatment was 10.07 with a Std deviation of 1.486. After being given the treatment, the average intensity of nausea and vomiting was 4.27 times with a Std.devisiation of 1.033 by using Paired T-Test, it was found that the intensity of nausea and vomiting during the first trimester in pregnant women,when the pretest and posttest produced a P value: 0.000, it can be concluded that there is a difference in the intensity of nausea and vomiting before and after being given Lavender Aromatherapy in first trimester pregnant women.<sup>7</sup>

In the lemon aromatherapy group, it was found that the average level of emesis gravidarum before being given lemon aromatherapy was (11.47) and the average level of emesis gravidarum. after being given lemon aromatherapy was (6.27) with a difference in the level of emesis gravidarum (5.20). there was a very significant decrease in the level of Emesis Gravidarum afterbeing given lemon aromatherapy at TPMB R Bogor Regency in 2022.

This is in line with previous research by Wardani conducted at PMB Siti hajar in Natar District, South Lampung Regency in 2019 that the average nausea and vomiting in first trimester mothers before being given essential lemon obtained an INVR (Index Nausea Vomiting and Retching) value of 17.67 in the category of severe nausea - vomiting and after being given essential lemon obtained an INVR value of 11.53 in the category of moderate nausea vomiting.<sup>3</sup>

Research conducted by Rofi;ah 2019, the respondents inhaled the tissue when experiencing nausea and / or vomiting for 5 minutes which had been given  $\pm$  5 drops of lemon essential oil for 12 hours which continued to ask the degree of nausea and vomiting after the intervention. The measuring instrument in this study was RHODES which showed that the level of emesis gravidarum before being given lemon aromatherapy in the score range 3 -23. The mean in each group was 8.41; 11.47; and 11.50. The score range in each group is 3-19; 4-21; and 4-23. The level of emesis gravidarum after being given lemon aromatherapy in the score range 0-19. The mean in each group was 5.29; 6.13; and 3.71. The range of scores in each group is 0-19; 0-14; and 0-9. There is no difference in the effectiveness of lemon aromatherapy among the three groups in overcoming emesis gravidarum, but if analyzed in each group, the results show that lemon aromatherapy doses of 0.2 and 0.3 are effective in overcoming emesis gravidarum.<sup>8</sup>

## **2. Effect of Lavender Aromatherapy on Pretest and Post Test Emesis Gravidarum**

This study states that in the lavender aromatherapy group, the p-value is  $0.001 < 0.05$ , meaning that there is an influence between lavender aromatherapy on the level of emesis gravidarum.

In line with research conducted previously that lavender aromatherapy will experience a range of decreased nausea and vomiting but still in the same category, the effect of giving lavender

aromatherapy to reduce vomiting nausea in first trimester pregnant women in the Jambu Kulon Health Center area is effective for reducing nausea and vomiting in pregnant women at PMB Fauziah Hatta Palembang using the paired T statistical test, the significant value in the experimental group is p-value ( $<0.001 < \alpha (0.05)$ ). While in the control group the p-value ( $0.205 > \alpha (0.05)$ ). So it can be concluded that giving lavender aromatherapy is more significant than giving counseling to reduce nausea and vomiting. The results of the analysis using the Independent T test showed a significant difference in the reduction of nausea and vomiting in both groups ( $\rho = <0.001 < \alpha = 0.05$ ).<sup>6</sup>

Based on the results of research conducted by bella, 2021, it can be seen that the average value before being given aromatherapy was 8.61. and the average after giving aromatherapy was 4.24 with the difference before and after the intervention being 4.37 and the p-value obtained was 0.000 with a level of significance  $\alpha = <0.05$ . Because the p-value of  $0.000 < 0.05$ , the "Hypothesis is accepted".<sup>5</sup>

Lavender aroma therapy is aroma therapy that uses essential oils from lavender flowers, which has the main components of Linalool and Linalyl Acetate which can provide a comfortable effect, about and increase relaxation Appleton (2012). The lavender aromatherapy group contains linalyl acetate and linalool where linalyl acetate serves to relax and relax the nervous system and muscles that experience tension while linalool acts as a relaxant and sedative so that it can reduce pain.<sup>7</sup>

The main components of lavender therapeutic aroma include linalool, linalyl acetate, 1,8- cineol, B-ocimene, terpinen-4-ol. Linalool is a component of lavender that has an effect as a sedative or calming substance and is commonly used as an aroma therapy that affects the body's neuroendocrine system which affects the release of hormones and neurotransmitters. This situation will increase the sense of comfort in pregnant women who experience nausea and vomiting.<sup>7</sup>

This can improve the psychological or emotional condition of pregnant women and can reduce the intensity of nausea and vomiting in pregnant women. Lavender aromatherapy works by affecting the work of the brain, the olfactory nerves that are stimulated by the presence of certain aromas, are directly related to the Hypothalamus. The hypothalamus is the part of the brain that controls the glandular system, regulates hormones, and affects growth and other body activities, such as heart rate, respiratory function, digestion, body temperature and hunger. In addition, when scented oils are inhaled or applied, nerve cells are aroused and affect the performance of the limbic system. The limbic system is associated with the regions of the brain related to memory function, blood circulation, and the glandular system. The optimal duration to get rid of nausea and vomiting is 20 minutes<sup>6</sup>

That the provision of lavender aromatherapy has an effect on reducing nausea and vomiting in first trimester pregnant women. this happens because the content of lavender, namely linalool, has an effect as a sedative substance (tranquilizer) which can be used to influence the neuroendocrine system

in the body so that it affects the release of hormones and neuroendocrine. The impact of giving this aromatherapy will increase the sense of comfort and calmness in pregnantwomen.

### 3. Effect of Lemon Aromatherapy on Pretest and Post Test Emesis Gravidarum

The results of this study in the lemon aromatherapy group obtained a p-value of  $0.000 < 0.05$ , meaning that there is an influence between the administration of lemon aromatherapy on the level of emesis gravidarum.

In line with previous research that the effectiveness of lemon essentials in overcoming the frequency of nausea and vomiting in first trimester pregnant women is 6.133 which means that first trimester mothers who do lemon essentials can reduce the value of Index Nausea, Vomiting, and Retching (INVR) by 6.133 times compared to before lemon essential therapy. Changes in lemon essential therapy on emesis gravidarum in first trimester mothers from severe category to moderate category. obtained a p-value of  $0.000 (\alpha \leq 0.05)$  which means that there is an effect of lemon essentials on emesis gravidarum in first trimester mothers at PMB Siti Hajar SST in Natar District, South Lampung Regency in 2019.<sup>3</sup>

In Hastuty's research 2012<sup>1</sup> that in this study looking at the difference in the frequency of nausea and vomiting before and after being given lemon aromatherapy inhalation was analyzed using Wilcoxon. From the results of the study it is known that there is a difference in the frequency of nausea and vomiting in pregnant women before and after being given lemon aromatherapy inhalation with a p-value = 0.001.<sup>9</sup>

Based on the results of other studies, the Rhodes index score of nausea and vomiting before being given lemon aromatherapy Mean + SD 23.33 + 3.91, after being given lemon aromatherapy Mean + SD 13.67 + 4.071 Rhodes index score from the category of moderate nausea and vomiting to mild, the results of the Wilcoxon Sign Rank Test analysis there was a significant decrease in the Rhodes index score of nausea and vomiting after pregnant women inhaled lemon aromatherapy results P value =  $0.0001 < \alpha = 0.05$ .<sup>10</sup>

Lemon aromatherapy derived from the extraction of lemon peel (Citrus Lemon) is one type of aromatherapy that is safe for pregnancy and childbirth. Lemon essential oil contains 66-80% limonene, geranyl acetate, nerol, linalyl acetate,  $\beta$  pinene 0.4-15%,  $\alpha$  pinene 1-4%, terpinene 6-14% and myrcen. Chemical compounds such as geranyl acetate, nerol, linalyl acetate, have antidepressant, antiseptic, antispasmodic, sexual arousal enhancer and mild sedative effects.<sup>10</sup>

Monoterpenes are the most common type of terpenes found in plant essential oils, terpenes in lemon aromatherapy oil 6-14%. In medical applications monoterpenes are used as sedatives. Linalyl acetate contained in lemon aromatherapy is an ester compound formed through the combination of organic acids and alcohol. Esters are very useful for normalizing emotional states and unbalanced body



conditions, also have properties as sedatives, tonics, especially in the nervous system.<sup>2</sup>

Lemon aromatherapy contains limonene which will inhibit the action of prostaglandins so as to reduce pain and function to control cyclooxygenase I and II, prevent prostaglandin activity and reduce pain including nausea and vomiting.<sup>8</sup>

When inhaling aromatic substances or lemon essential oil will emit biomolecules, receptor cells in the nose to send impulses directly to the olfactory in the brain or limbic system in the brain. The limbic system is closely linked to other systems that control memory, emotions, hormones, sex, and heart rate. Immediately the impulses stimulate it to release hormones that are able to reassure and cause feelings of calm and affect a person's physical and mental changes so that it can reduce nausea and vomiting experienced by pregnant women in the 1st trimester.

## CONCLUSION

There is an effect of giving lavender aromatherapy and giving lemon aromatherapy in reducing Emesis Gravidarum. there is a difference in giving lavender aromatherapy and lemon aromatherapy to Emesis Gravidarum because both have the same effectiveness.

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