



## EFFECT PEPPERMINT AROMATHERAPY INHALATION REDUCING NAUSEA AND VOMITING IN FIRST TRIMESTER OF PREGNANCY

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### Abstract

The Nausea and vomiting in pregnant women in the first trimester was physiologically due to an increase in the Human Chorionic Gonadotrophin (HCG) hormone which affects the digestive system, causing complaints of nausea and vomiting. One of them was handling nausea and vomiting by administering peppermint aromatherapy inhalation. Peppermint had a sharp menthol aroma, a distinctive cold refreshing smell, and the smell of menthol which had properties against contractions by inhibiting muscle contact caused by serotonin hormone so that it could successfully overcome nausea and vomiting in pregnant women. This study aims to determine the differences in nausea and vomiting before and after administration of peppermint aromatherapy inhalation dose, 0,1-0,2 ml for 1-10 minutes to pregnant women in their first This type of research was quasi-experimental, one-group pre-and post-test design. The number of samples was 48 respondents intervention and treatments, with the sampling method "purposive sampling" type of non-probability sampling. The data collection tool was a Pregnancy Unique Quantification of Emesis and Nausea (PUQE) questionnaire. Data analysis techniques used univariate and bivariate analysis. The results of data analysis used the Wilcoxon test and obtained a p-value of  $0.000 < p < 0.05$ . This means that there were differences in nausea and vomiting before and after giving peppermint aromatherapy inhalation to pregnant women in their first trimester. It is expected that pregnant women use peppermint aromatherapy inhalation to treat nausea and vomiting because it does not have a toxic effect on the health of the mother and fetus.

**Keywords:** *nausea vomiting; first trimester pregnant women; peppermint aromatherapy*

### 1. Introduction

The A woman during pregnancy may experience unwanted complaints (Pudiasuti, 2012). Complaints during the first trimester of pregnancy that arise include nausea, vomiting, hypersalivation, dizziness, fatigue, chest burning (heartburn), increased frequency of urination, constipation and psychological complaints (Irianti et al, 2013). Nausea is an unwillingness associated with feeling tired or wanting to vomit, while vomiting is the release of stomach contents through the mouth due to unconscious muscle spasms (Tharpe, 2014).

During pregnancy, there are tremendous changes in the endocrine system that are critical

to the support of pregnancy, common fetal turnarounds, and post-pregnancy recovery. A positive *Human Chorionic Gonadotrophin* (HCG) test and match rate (HCG) are sometimes increased up to six weeks of growth. Physiologically, due to increased levels of estrogen in the blood that affect the digestive system and hormonal changes in the endocrine system that occur during pregnancy, mainly due to increased levels of HCG, the majority of pregnant women experience nausea and vomiting (Wiknjastro, 2016). These complaints occur in the morning but sometimes occur at any time and around the night (Andriana, 2013).

According to Yantina (2016), nausea and vomiting often occur during pregnancy, around 60% -70% will experience it in the early trimester. The side effects will be more stable during the normal range in the early trimester of pregnancy,

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which will generally take place at 12-16 weeks of growth.

Nausea, vomiting is a common feature suffered by pregnant women, but this side effect becomes very dangerous if *nausea and vomiting* worsens to *hyper nausea and vomiting*, it can cause death for the mother and the baby in her stomach where this occurs in around 0.5% - 2% of all pregnant women (Rachmaningtyas, 2013).

According to WHO (2013), these complaints create obstacles such as severe fatigue, activity disturbances, minimal rehydration of the *kidney tissue* to the point where it becomes liver damage which can be a serious cause in increasing the Maternal Mortality Rate (MMR).

Wahyuningsih. M., (2016) revealed that the frequency of nausea and vomiting appears in pregnant women in almost all parts of the country, especially 70% - 80% of all pregnancies worldwide. The majority of 70% - 80% experience *morning sickness* and as much as 1-2% experience severe *morning sickness*.

According to the World Health Organization (WHO, 2015) the number of nausea and vomiting reaches 12.5% from various parts of the country. In Indonesia this occurs as much as 50% - 90% and cases of *hyperemesis gravidarum* reach 14.8%, which occurs in 60% - 80% of *primigravidas* and 40% - 60% occurs in *multigravidas*.

The incidence of nausea and vomiting in Indonesia is 50-90% of cases, this does not represent an extraordinary risk for maternal mortality, but nausea and vomiting causes fluid deficiency, decreases health and personal satisfaction, has a negative impact on daily activities, work and family life (Wood H., McKellar, LV, and Lughtbody, M., 2013).

Of the 360 pregnant women, 2% experienced *morning sickness* and around 80% experienced nausea and vomiting throughout the day. This condition usually persists and peaks at two months of development. However, around 18% of these events can continue until delivery (Susanti, 2017).

According to Pujiastuti (2014) more than 85% of pregnant women feel that their activities are constrained and the majority overcome them by taking painkillers. However, the use of inaccurate drugs is often dangerous because they have toxic effects on the mother and baby. One of the ways to treat nausea and vomiting in the first trimester is non-pharmacological efforts, namely by administering *peppermint* aromatherapy (*mentha piperita*).

Research from Craig Hospital (2013)

healing with aromatherapy inhalation methods using essential oil effective in overcoming various health problems. *Peppermint* oil is a group hard oil containing menthol (35-45%) and Mentone (10-30%) which are safe to use in a maximum dose of 1 ml in first pregnancy women (Shokrpour.M., dkk., 2018).

*Peppermint* belongs to the *labiate* tribe which has a *sharp menthol* of aroma, a distinctive smell refreshing cold, as well as a deep menthol smell. *Peppermint* has properties against contractions which successfully treat nausea, digestive system, difficulty passing wind, defecation, blockage, migraine and collapse (Zuraida and Sari, 2017).

A *peppermint* based treatment with menthol (35% -45%) and *menthone* (10% -30%) which has antiemetic and antispasmodic effects for the lining of the gastrointestinal tract and digestive organs by suppressing muscle compression by serotonin and other body chemicals. *Peppermint* is widely used to treat nausea and even dizziness. In addition, treatments based on *peppermint* aromatherapy are not difficult to obtain and the costs are quite affordable (Stea, et al., 2014).

Research by Ratih, Faizatul, and Lutfi (2017) found a decrease in the size of pre- and post nausea vomiting by administering *peppermint* fragrance to pregnant women in the first trimester of 1.65 while the decrease in the frequency of repeated vomiting was 1.65 (1-2 times / day).

According to Agnes and Yuni (2017) before being given *peppermint* aromatherapy, the majority of those who experienced nausea and vomiting were in the heavy category, above nine pregnant women (60%), while after being given *peppermint* aromatherapy, eight pregnant women (53.3%) were classified as mild.

Research by Rizkia (2018), there was a significant reduction in the group given *peppermint* which was 8.63 higher than the control group. This means that the administration of *peppermint* aromatherapy to early trimester pregnant women has succeeded in reducing nausea and vomiting.

Research by Tutik (2020), the administration of *peppermint* aromatherapy to the five first trimester pregnant women decreased by 3-6 times compared to before administration of 5-9 times. Recurrence of nausea and vomiting to 2-3 times after administration of *peppermint*. This proves that the healing properties of *peppermint* effectively cure these complaints.

Research by Fauziah, Aulya, and Widawati (2022), in the *peppermint* intervention group at intercession was 6.87 and 3.87 with a *pairing t test*. This shows how the healing aroma of *peppermint*

can reduce recurrence of nausea and vomiting.

Supported by Agustini, Wulandari, and Dewi (2022), showed an average value of nausea and vomiting when given *peppermint* aromatherapy-based treatment from a moderate classification of 8.15 to a mild classification of 4.80. Shows presence decreased nausea and vomiting after administration of *peppermint aromatherapy*.

Based on the survey results at the South Denpasar Health Center IV in 2022, it shows that 70-80% of pregnant women experience nausea and vomiting during the first trimester. Showed that 15 early trimester pregnant women experienced nausea and vomiting. Overall treating it with gastric or antiemetic drugs and have never used *peppermint aromatherapy drugs*.

Given its height this incident, it becomes important to explore non-pharmacological intervention. I was interested in conducting an experiment on differences in nausea and vomiting before and after administration of *peppermint* aromatherapy inhalation to first-trimester pregnant women at the Independent Practice of Midwife Made Sri Devi Indrawati, S.Keb.,Bd., South Denpasar.

The researcher chose the Independent Practice of Midwives Made Sri Devi Indrawati, S.Keb., Bd., as the research location because it has superior services related to complementary health insurance which have been carried out since 2020. The complementary services provided are prenatal gentle yoga, aromatherapy, acupressure, and hypnotherapy. In addition to having a certificate as a therapist related to complementary services Midwife Made Sri Devi Indrawati, S.Keb., Bd., also regularly conducts workshops that apply complementary therapies in midwifery services in collaboration with experts in their field. Researchers are interested primarily in the use of aromatherapy as a non-pharmacological complementary therapy to treat nausea and vomiting.

Researchers chose *peppermint* aromatherapy because during the preliminary study almost the majority of pregnant women who experienced nausea and vomiting chose *peppermint* aromatherapy with the highest composition of menthol, menthone and methyl acetate (73.7-85.8%). *Peppermint* aromatherapy is easy to obtain and the price is relatively affordable, smells good, and contains *menthol* essential oil which has carminative and antispasmodic effects to treat nausea and vomiting.

For this reason, I wanted to conduct an experimental test study to significantly prove the

difference between nausea and vomiting before and after administration of *peppermint* aromatherapy inhalation to pregnant women in their first trimester. With the aim of proving the use of non-pharmacological inhalation aromatherapy *peppermint* can reduce complaints of nausea and vomiting in first-trimester pregnant women

## 2. Method

This study used a *one-group pre-and posttest design*, with a *quasi-experimental research approach*. This research was conducted from 25 February to 21 March 2023.

The sampling method is "*Purposive Sampling*" type of *non-probability sampling* using the PUQE-24 questionnaire (*24-hour Pregnancy Unique Quantification of Emesis*).

The population in this study were all first trimester pregnant women who experienced nausea and vomiting with ethical consideration of first trimester pregnant women who liked *peppermint* aromatherapy, no allergies to *peppermint* aromatherapy, Who met the inclusion criteria and were willing to sign *informed consent* as many as 48 respondents using the "*Purposive Sampling*" technique type of *non-probability sampling*.

Measurement of nausea and vomiting before and after administration of *peppermint* aromatherapy inhalation to first trimester pregnant women was carried out using the PUQE-24 (*24-hour Pregnancy Unique Quantification of Emesis*) questionnaire which has been modified to 12 hours of monitoring.

Researchers used 100% *peppermint* aromatherapy, 1 drop equivalent to 0.1-0.2 ml on non-aromatic tissue by inhalation with a distance of 2-3 cm from the nose for 1-10 minutes. Performed for seven days.

Data analysis used is univariate analysis and bivariate analysis. Inclusion criteria in this study were first trimester pregnant women who experienced nausea and vomiting who were willing to be respondents by signing an informed consent, had received standard antiemetic therapy such as vitamin B6, and had never used *peppermint* aromatherapy to treat nausea and vomiting.

This research follows three basic principles of research, namely respect for human dignity (*Respect for persons*), benefits (*Beneficence*), and justice (*Justice*).

Ethical Clearance LB.02.03/EA/ number: KEPK/0097/2023 dated 24 February 2023 Like

Ethics.

### 3. Result and Discussion

#### Results

Statistic data the working area of Puskesmas IV South Denpasar tahun 2021-2022 it was obtained that 80-90% of first trimester pregnant women experienced nausea and vomiting. There were 48 research subjects who met the inclusion criteria, namely first trimester pregnant women who experienced nausea and vomiting, had received standard antiemetic therapy such as vitamin B6, had never used peppermint aromatherapy to treat nausea and vomiting and were willing to become respondents and were successful.

Participate in the experiment until the specified time is 7 days considering that maximum evaluation results can be obtained by monitoring for 1 week giving *peppermint* aromatherapy inhalation to the respondents. During the 7 days of monitoring this research so that it is of maximum benefit to the respondents so that the nausea and vomiting experienced is reduced and or until it disappears.

The results of the study from 48 respondents who met the study inclusion criteria showed a decrease in the overall intensity of nausea and vomiting. The 5 respondents who complained of nausea and vomiting were not included in the research subjects and had been dropped out due to the unpreparedness of the respondents to routinely inhale *peppermint* aromatherapy for 7 consecutive days and consume antiemetic drugs during the study as many as 3 respondents, 1 respondent experienced gastrointestinal problems and 1 respondent.

Respondents complained of increasingly severe nausea and vomiting accompanied by shortness of breath. Respondents who have dropped out are still being monitored by researchers and collaborating with obstetrics and gynecology specialists in administering antiemetic drugs as well as for further treatment related to respondents' complaints along with giving *peppermint* aromatherapy inhalation which is done by respondents only when conditions improve as a way to make *women* pregnant more relaxed and comfortable.

Data on the characteristics of respondents who are not included in the research variables. This data collection was carried out on pregnant women in the first trimester with nausea and vomiting as many as 48 respondents

**Table 1.** Respondent Characteristics Data

| Age        | Frequency(n) | Percentage (%) |
|------------|--------------|----------------|
| < 20 th    | 3            | 6,2            |
| 20 - 35 th | 45           | 93,8           |
| Total      | 48           | 100            |

  

| Parity       | Frequency(n) | Percentage (%) |
|--------------|--------------|----------------|
| Primigravida | 29           | 60,4           |
| Multigravida | 19           | 39,6           |
| Total        | 48           | 100            |

  

| Age of Pregnancy | Frequency(n) | Percentage (%) |
|------------------|--------------|----------------|
| 4-6 weeks        | 4            | 8,2            |
| 7-9 weeks        | 19           | 39,7           |
| 10-12 weeks      | 25           | 52,1           |
| Total            | 48           | 100            |

  

| Education      | Frequency(n) | Percentage (%) |
|----------------|--------------|----------------|
| SMA/SMK        | 21           | 43,8           |
| Diploma/Master | 27           | 56,2           |
| Total          | 48           | 100            |

  

| Work         | Frequency(n) | Percentage (%) |
|--------------|--------------|----------------|
| Work         | 30           | 62,5           |
| Doesn't work | 18           | 37,5           |
| Total        | 48           | 100            |

Table 1 shows characteristic data from 48 respondents, based on age as many as 45 respondents (93.8%) with an age range of 20-35 years and 3 respondents (6.2%) aged less than 20 years. Based on parity, 29 respondents (60.4%) were primigravida and 19 respondents (39.6%) were multigravida. Based on gestational age, 4 respondents (8.2%) complained of nausea and vomiting at 4-6 weeks of gestation, 19 respondents (39.7%) at 7-9 weeks of gestation, 25 respondents (52.1%) at gestational age 10-12 weeks. Based on education, 21 respondents (43.8%) had high school/ vocational high school education and 27 respondents (56.2%) had Diploma/Bachelor degrees. Based on work, 30 respondents (62.5%) were working and 18 respondents (37.5%) were not working.

#### Observations on research subjects based on research variables

Based on the results of research that was conducted on February 25 to 21 March 2023 in first trimester pregnant women with nausea and vomiting before and after giving *peppermint* aromatherapy inhalation obtained the following results;

#### a. Nausea and vomiting of pregnant women in the first trimester before being given *peppermint* aromatherapy inhalation

Observations of first trimester pregnant women with nausea and vomiting before being given *peppermint* aromatherapy inhalation were assessed using the *PUQE-24* questionnaire to

collect information on the intensity of nausea and vomiting in first trimester pregnant women which has been modified from 24 hours of monitoring nausea and vomiting to 12 hours of monitoring with considering the majority of complaints occurred in the morning and/or during the day and at night the respondents rested.

The *PUQE* questionnaire has 3 questions where the first question asks the respondent's intensity of nausea in the last 12 hours, the second question asks the respondent's vomiting intensity in the last 12 hours and the third question asks the intensity of empty vomiting or dry sighs without any expenditure in the last 12 hours.

Each question has a minimum score of 1 and a maximum of 5. The total score for nausea and vomiting has a minimum value of 3 and a maximum of 15, where the range of scores for nausea and vomiting in pregnant women in the first trimester is divided into 3, namely; 1 = 1-6, 2 = 7-12, and 3 = 13-15. The results of the distribution of nausea and vomiting data before being given *peppermint* aromatherapy inhalation are described in table 2.

**Table 2.** Nausea and vomiting pregnant mothers 1 trimester before given *peppermint* aromatherapy inhalation

|  | n  | Min | Max | Mean | Median | Std. Deviation |
|--|----|-----|-----|------|--------|----------------|
| Before doing <i>peppermint</i> aromatherapy inhalation | 48 | 6   | 12  | 8,94 | 9,00   | 1,706          |

Table 2 shows the intensity of nausea and vomiting of pregnant women before being given *peppermint* aromatherapy inhalation. From a total of 48 respondents, the minimum intensity of nausea and vomiting was 6 and the maximum was 12. The mean value (*mean*) was 8.94, the *median* value was 9.00 and the standard value deviation 1.706.

**b. Nausea and vomiting in first trimester pregnant women after being given *peppermint* aromatherapy inhalation**

The results of observations of first trimester pregnant women with nausea and vomiting after being given *peppermint* aromatherapy inhalation were assessed on the seventh day. Where after giving *peppermint* aromatherapy inhalation for seven consecutive days as much as one drop equivalent to 0.1-0.2 ml once per day in the morning followed by evaluating the intensity of nausea using the *PUQE* questionnaire which has been modified from 24 hours monitoring to 12

hours monitoring on the seventh day. The distribution of data after being given *peppermint* aromatherapy inhalation is described in Table 3.

**Table 3.** Nausea and vomiting pregnant mothers 1 trimester after given *peppermint* aromatherapy inhalation

|   | n  | Min | Max | Mean | Median | Std. Deviation |
|---|----|-----|-----|------|--------|----------------|
| After doing <i>peppermint</i> aromatherapy inhalation | 48 | 3   | 9   | 4,67 | 4,00   | 1,310          |

Table 3 shows the intensity of nausea and vomiting of pregnant women after being given *peppermint* aromatherapy inhalation. A total of 48 respondents obtained a minimum intensity of nausea and vomiting of 3 and a maximum of 9. The mean value (*mean*) was 4.67, the *median* value was 4.00 and the standard value deviation 1.310.

**c. Differences in nausea and vomiting in the first trimester of pregnant women before and after being given *peppermint* aromatherapy inhalation**

The difference in the distribution of nausea and vomiting intensity data among respondents before and after administration of *peppermint* aromatherapy inhalation shows the results of the analysis conducted on 48 respondents, that the mean value before inhalation of *peppermint* aromatherapy was 8.94, a median value of 9.00 with a standard deviation of 1.706 and the mean number after inhalation of *peppermint* aromatherapy was 4.67, the mean value was 4.00 with a standard deviation of 1.310.

This shows a decrease in the intensity of nausea and vomiting before and after aromatherapy *peppermint* seen from the value of the difference before and after of 4.27.

The highest score before inhaling *peppermint* aromatherapy was 12 and the highest score after inhaling *peppermint* aromatherapy was 9 with a difference in value of 3.

The lowest value before inhalation of *peppermint* aromatherapy was 6 and the lowest value after inhalation of *peppermint* aromatherapy was 3 with a difference in value of 3.

The difference in the minimum nausea vomiting score of 3 and a maximum of 3 indicates a decrease in the intensity of nausea and vomiting.

The mean value before inhalation of *peppermint* aromatherapy was 9.00 while after inhalation of *peppermint* aromatherapy was 4.00.

This shows that the mean value after

inhalation of *peppermint* aromatherapy is lower than the measurement before inhalation of *peppermint* aromatherapy with a difference of 5.00. In addition, the difference in value between the measurements before and after giving *peppermint* aromatherapy inhalation is quite significant because the standard deviation value is small.

**Table 4.** Data Normality Test

| Pregnant Mother<br>Trimester I                  |        | Shapiro-Wilk |    |             |
|---|--------|--------------|----|-------------|
|   |        | Statistic    | Df | Signifikasi |
| Inhalation<br>Aromatherapy<br><i>Peppermint</i> | Before | 0,932        | 48 | 0,008       |
|   | After  | 0,869        | 48 | 0,000       |

Table 4 data normality test with a total of 48 respondents shows the output results of a significance value for all data with the Shapiro-Wilk test <0.05, it can be concluded that the research data is not normally distributed. Because the research data were not normally distributed, non-parametric statistics were used with the Wilcoxon test.

**Table 5.** Differences in Nausea Vomiting in Pregnant Women Trimester I Before and After Administered Peppermint Aromatherapy Inhalation

|  | Median<br>(minimum-<br>maksimum) | Negative<br>Ranks | Positive<br>Ranks | Ties | <i>p</i> -<br><i>value</i> |
|--|----------------------------------|-------------------|-------------------|------|----------------------------|
| Before doing<br><i>peppermint</i><br>aromatherap<br>y inhalation | 9,00<br>(8,00-10,75)             | 48                | 0                 | 0    | 0,000                      |
| After doing<br><i>peppermint</i><br>aromatherap<br>y inhalation  | 4,00<br>(4,00-5,00)              | 48                | 0                 |      |                            |

Table 5 is the results of the Wilcoxon test where based on the Negative Ranks data output or the negative difference between inhalation of *peppermint* aromatherapy for before and after being given inhalation of *peppermint* aromatherapy there is a negative value of 48 (n) which means 48 pregnant women in the first trimester still experience an increase in nausea and vomiting from the value before it was given peppermint aromatherapy inhalation.

Positive rank or positive difference between inhalation of *peppermint* aromatherapy for before and after being given *peppermint* aromatherapy inhalation has a value of 0 positive (n), indicating a decrease from the value before to

after being given inhalation of *peppermint* aromatherapy, meaning that first trimester pregnant women experience a decrease in nausea and vomiting after administration of aromatherapy inhalation *peppermint*.

Based on the data above, it is known that the *p*-value of 0.000 is less than <0.05, so the hypothesis is accepted. This means that there is a difference in nausea and vomiting in the first trimester of pregnant women before and after giving *peppermint aromatherapy inhalation*.

Where it can be seen that there is a difference between the results of *peppermint* aromatherapy inhalation before and after being given *peppermint* aromatherapy inhalation so it can be concluded that there is a difference in nausea and vomiting before and after being given *peppermint* aromatherapy inhalation to pregnant women in the first trimester at the Independent Practice Midwife Made Sri Devi Indrawati, S. Keb., Bd ., Denpasar Selatan from 25 February to 21 March 2023.

## Discussion

### a. Identification of nausea and vomiting in pregnant women in the first trimester before being given *peppermint* aromatherapy inhalation.

The research subjects were 48 respondents who met the research inclusion criteria. The characteristics of the respondents that were collected by the researcher apart from the demographic data of the respondents included age, parity, gestational age, education, and occupation of the respondents. This is related to other factors that influence the complaints of nausea and vomiting in the first trimester of pregnant women.

*The American College of Obstetricians and Gynecologists* (ACOG, 2018), states that the physiology of nausea and vomiting in pregnancy apart from the relationship between an increase in the hormone HCG, a drastic increase in the hormones estrogen and progesterone due to the implantation of products of conception, there are also psychological factors that cause hormonal feelings. Different for each pregnant woman.

Nausea and vomiting in pregnant women in the first trimester is usually influenced by several factors, including gravida or parity, hormonal, psychosocial, occupation or activity, mother's age and husband's support (Sulistiyawati, A., 2013).

From the results of the study, according to the theory of nausea and vomiting during the first trimester of pregnancy, it can be caused by several factors including age, parity, education

and occupation.

A. The age of pregnant women who are at highrisk is the age of less than 20 years and more than 35 years. Nausea and vomiting occurs at the age of under 20 years due to insufficient maturity of the physical, mental and social functions of the expectant mother so that it can cause physical doubts, love and care and care for the child to be born later.

Meanwhile, at the age of more than 35 years it is influenced by psychological factors, where the mother is not ready to get pregnant again or does not even want another pregnancy so she will feel depressed and cause stress to the mother. A person's age is the sum of ages which in outline is an indicator of maturity in every decision making that refers to each experience.

The more mature, the level of maturity and strength of a person will be more mature and logical in thinking (Wiknjastro, 2016). In this study, the age range of mothers less than 20 years was 3 respondents and the age range 20-35 years was 45 respondents.

B. Gravida or parity in pregnant women has an influence on the intensity of nausea and vomiting. Based on the results of the study, the majority of primigravida mothers, before giving *peppermint* aromatherapy inhalation, complained that the intensity of nausea and vomiting was in the range of 7-12, this was due to unpreparedness for physical and hormonal changes that were felt for the first time by primigravida mothers, causing more frequent nausea and vomiting, while in multigravida mothers who have previously experienced this discomfort are better able to overcome their nausea and vomiting (Sulistyawati, 2013).

In this study, there were 29 respondents from primigravida mothers and 19 respondents from multigravida mothers.

According to Saifuddin (2016), gestational age in pregnant women is a physiological factor that causes complaints of nausea and vomiting, which is related to hormonal changes during placental implantation. Most of the occurrences of nausea and vomiting occur from 9-10 weeks of incubation period, but it does not rule out the possibility that some pregnant women who have high sensitivity in the digestive tract experience these complaints since the beginning of pregnancy. This will take place during the first trimester and will last 12-14 weeks of incubation period.

Some pregnant women complain of nausea and vomiting up to 20-24 weeks of gestation,

this can be influenced by readiness for pregnancy, psychology and mother's knowledge. The results showed that there were 4 respondents (8.2%) complaining of nausea and vomiting at 4-6 weeks of gestation, 19 respondents (39.7%) at 7-9 weeks of gestation, 25 respondents (52.1%) at 10-12 weeks of gestation.

C. The education of pregnant women influences their own decisions and how to deal with the nausea and vomiting they experience. In addition, curiosity and a willingness to learn in pregnant women can also increase knowledge regarding the handling of nausea and vomiting. Based on the research, there were 21 respondents with high school/vocational high school education and 27 respondents with diploma/ graduate degrees. The majority of first-trimester pregnant women who were respondents, even though they had different levels of education, were open and active in learning and adding information related to the treatment of nausea and vomiting peppermint aromatherapy inhalation.

D. The work of pregnant women is related to the level of activity of the mother, working mothers tend to feel more tired during pregnancy due to physical changes as well as work demands that must be completed. Meanwhile, pregnant women who do not work tend to feel bored because of their monotonous activities, so they tend to be more sensitive to their nausea and vomiting. In this study, it was found that 30 respondents were working and 18 respondents were not working.

The results of the study before being given where assessment of the intensity of nausea and vomiting in first trimester pregnant women from 48 respondents with the PUQE questionnaire was monitored within 12 hours monitoring obtained an average value (*mean*) of 8.94 which means nausea and vomiting of pregnant women is in the range of scores 2 = 7-12 which occurs in the first trimester. The *median* value is 9.00 where the minimum value is the maximum (8.00-10.75). The standard deviation value is 1.706 with a minimum value of nausea and vomiting intensity of 6 and a maximum value of 12.

#### **b. Identification of nausea and vomiting in first trimester pregnant women after being given peppermint aromatherapy inhalation**

This study showed that 48 respondents who were given *peppermint aromatherapy*, most of them had an average value of nausea and vomiting intensity of 4.67.

Where most pregnant women have

intensity of nausea and vomiting with a score range of 1 = 1-6 after being given inhalation of *peppermint* aromatherapy as much as one drop equivalent to 0.1-0.2 ml every morning for 7 days.

The results of the study before being given *peppermint* aromatherapy inhalation where the average value (*mean*) was 8.94 was in the score range 2 = 7-12 after being given *peppermint* aromatherapy inhalation to 4.67 in the score range 1 = 1-6.

The mean value (*median*) before inhaling *peppermint* aromatherapy was 9.00 where the minimum-maximum value was (8.00-10.75), after being given *peppermint* aromatherapy inhalation to 4.00 where the minimum-maximum value was (4.00-5.00).

The standard deviation value before inhaling *peppermint* aromatherapy was 1.706 to 1.310 after being given *peppermint* aromatherapy inhalation, with a minimum value of nausea and vomiting intensity before inhaling *peppermint* aromatherapy of 6 to 3 after inhalation *peppermint* aromatherapy while the maximum value of before inhalation of *peppermint* aromatherapy was 12 to 9 after inhalation of *peppermint* aromatherapy.

Referring to these results, it can be stated that there was a decrease in the intensity of nausea and vomiting after being given *peppermint* aromatherapy.

*Peppermint (Mentha Piperita L)* is one of the 3 types of the *Mentha* family that produces *peppermint* oil which is a *hard oil* group (Nurhidayat, 2014). According to Shokrpour. M., et al., (2018), *Peppermint oil* contains menthol, monoterpenes, menthofurans, sesquiterpenes, triterpenes, flavonoids, carotenoids, tannins, mentones, isomentone, piperitone and metal acetic acid derivatives with the highest composition being menthol, menthone and methyl acetate (73.7-85.8%) where as menthol (35-45%) also *menthone* (10%-30%).

Menthol is a naturally occurring chemical of the monoterpene species. Menthol has different abilities such as carminative, antispasmodic, diaphoretic and antiemetic. Menthol contains *peppermint* which is an unstable compound which has a specific smell and taste (Ali et al, 2015).

The menthol composition in *peppermint* oil can work with the digestive system, relieve stomach spasms and relax stomach muscles because it has a mild sedative effect and contains carminative as well as antispasmodics operating in the small digestive organs in the large intestine (Widiyaningsih, 2018).

Menthol acts as a 5HT3 receptor which blocks receptors in sensory systems related to the

brain and stomach. Causes of pain can interfere with *enterochromaffin* cells in the digestive system which triggers the release of serotonin. Serotonin activates 5HT3 receptors associated with nausea and vomiting focus, this menthol activity makes 19 receptors stop continuing this bad taste so that nausea and vomiting do not occur (Intan et al, 2015).

In this study, researchers used 100% ready-to-use *peppermint* essential oil with the aim of making the results more effective and efficient. Based on the results of a study of nausea and vomiting in pregnant women in the first trimester before and after giving *peppermint* aromatherapy inhalation at the Independent Practice of Midwives Made Sri Devi Indrawati, S. Keb., Bd., South Denpasar from 25 February to 21 March 2023 there was a decrease due to the effect of giving aromatherapy inhalation *peppermint* which causes physiological and psychological changes in pregnant women so they feel relaxed and comfortable.

### **c. Analysis of differences in nausea and vomiting in the first trimester of pregnant women before and after given *peppermint* aromatherapy inhalation**

Based on the results of the analysis conducted, it can be concluded that the average value (*mean*) for before and after being given *peppermint* aromatherapy inhalation decreased by 4.27 where the average value before *peppermint* aromatherapy inhalation was 8.94 and after that it became 4.67.

The standard deviation value before inhaling *peppermint* aromatherapy was 1.706, decreasing to 1.310 after inhaling *peppermint* aromatherapy. This shows a decrease in the intensity of nausea and vomiting before and after being given *peppermint* aromatherapy.

The highest score before inhalation of *peppermint* aromatherapy was 12 and the highest score after inhalation of *peppermint* aromatherapy was 9 with a difference in value of 3.

The lowest value before inhalation of *peppermint* aromatherapy was 6 and the lowest value after inhalation of *peppermint* aromatherapy was 3 with a difference in value of 3.

The difference in the minimum nausea and vomiting score is 3 and the maximum is 3 indicating a decrease in the intensity of nausea and vomiting.

The *median* value before inhaling *peppermint* aromatherapy was 9.00 while after inhaling *peppermint* aromatherapy was 4.00. This shows that the mean value after inhaling *peppermint* aromatherapy is lower than the



measurement before inhaling *peppermint* aromatherapy with a difference of 5.00.

In addition, the difference in values between measurements before and after giving *peppermint* aromatherapy inhalation is quite significant because the standard deviation is small and the p-value is 0.000. So it can be concluded that there are differences in nausea and vomiting before and after administration of *peppermint* aromatherapy inhalation to pregnant women in their first trimester

This is also supported by several studies, one of which is research by Yantina (2016) which states that the average value of nausea and vomiting intensity before administration of essential *peppermint* oil is 15.60 with a standard deviation of 2.789. While the average value after giving *peppermint* essential oil was 11.66 with a deviation value of 2.566 with a p-value of 0.000 <0.05.

According to Rizkia's research (2018) states the group given *peppermint* aromatherapy had an average value of nausea and vomiting before being 13.57 and after being given *peppermint* aromatherapy to 4.94 with a p value of 0.001 <0.05.

It is also supported by the research by Agustini, Wulandari, and Dewi (2022) which stated that the average value of nausea and vomiting before being given *peppermint* aromatherapy was 8.15 and after being given *peppermint* aromatherapy it was 4.80 with a difference of 3.35 and a p value of 0.001 <0,05.

Research by Setiawan, A., et al., (2019), states that the main constituents of peppermint leaves are essential oils (0.5-4%) which contain menthol (30-55%) and menthone (14-32%). Menthol occurs mostly in the free alcohol form, with amounts between (3-5%) acetate and valeric esters. Other monoterpenes present include isomentone (2-10%), 1,8-cineole (6-14%), a-pinene (1.0-1.5%), b-pinene (1-2%), limonene (1-5%), neomenthol (2.5-3.5%) and menthofuran (1-9%). In addition, peppermint leaves themselves contain vitamin C, provitamin A, phosphorus, iron, calcium, and potassium.

*Peppermint* essential is useful for restoring body stamina, relieving nausea, headaches, preventing fever and has high antioxidant properties. So it is very useful to overcome complaints of nausea and vomiting in pregnant women in the first trimester. *Peppermint* aromatherapy can work on the digestive system where it can relieve stomach spasms and relax stomach muscles because it has a mild sedative effect and contains carminative as well as

antispasmodics operating in the small digestive organs in the large intestine (Widiyaningsih, 2018).

Menthol acts as a 5HT<sub>3</sub> receptor which blocks receptors in sensory systems related to the brain and stomach. Serotonin activates 5HT<sub>3</sub> receptors associated with nausea and vomiting focus, this menthol activity makes 19 receptors stop continuing this bad taste so that nausea and vomiting do not occur. In addition, *peppermint* aromatherapy can provide a relaxing effect so that respondents are comfortable and reduce their nausea and vomiting (Intan et al, 2015)

In this study, *peppermint* aromatherapy was given to reduce nausea and vomiting in the first trimester of pregnant women at the Independent Practice of Midwife Made Sri Devi Indrawati, S. Keb., Bd., South Denpasar from 25 February to 21 March 2023.

Based on research data, negative rank before being given *peppermint* aromatherapy inhalation of 48 and after being given aromatherapy inhalation *peppermint* by 48. Which indicated that overall 48 respondents experienced a decrease in the intensity of nausea and vomiting after being given *peppermint* aromatherapy.

This proves that there is a concordance between the results of the study and the theory that *peppermint* aromatherapy can reduce the intensity of nausea and vomiting of pregnant women in the first trimester from an intensity of 7-12 from an average value before of 8.94% to an intensity of 1-6 from an average value of 4 after .67%.

There was a decrease in the minimum value before and after being given *peppermint* aromatherapy by 3, while the decrease in the maximum value before and after being given *peppermint* aromatherapy was 3.

The median value decreased by 5.00 from the median value before it was 9.00 and after it was 4.00. The previous standard deviation value of 1.706 decreased to 1.310 after administration of *peppermint* aromatherapy.

So it was concluded that based on the results of the study there were significant differences in nausea and vomiting before and after administration of *peppermint* aromatherapy inhalation to pregnant women in the first trimester with a p-value of 0.000 <0.05.

Based on the data, the results of the study showed that it significantly reduced the intensity of nausea vomiting in first trimester pregnant women. Where with reduced nausea, vomiting affects the nutritional intake of pregnant women so that the quality of health of pregnant women

and fetuses is better.

The relationship between improving the health condition of the mother and fetus in addition to being influenced by the improvement in the amount of nutritional intake also affects the mother's psychology to be better than before.

Happy psychological effects during pregnancy also have a good impact on the psychological condition of the fetus. So that the baby will become more prosperous both in physical and psychological quality

The limitation of this study lies in the number of meetings with pregnant women because it is still in post-Covid 19 pandemic conditions. In addition, there are subjective factors related to the preference of aromatherapy in each pregnant woman and the scope of research is small in scope so that it cannot cover the entire research area.

This study, although on a small scale, can prove a significant effect of peppermint aromatherapy inhalation to reduce nausea and vomiting in first trimester pregnant women using a smaller dose of peppermint aromatherapy than other studies of 0.1-0.2 ml with the inhalation method using non-aroma wipes.

#### 4. Conclusion and Suggestion

The mean value of nausea and vomiting in the first trimester of pregnant women before being given *peppermint* aromatherapy inhalation.

The average value of nausea and vomiting in the first trimester of pregnant women after being given *peppermint* aromatherapy inhalation.

There is a difference in nausea and vomiting before and after being given *peppermint* aromatherapy to pregnant women in their first trimester

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