



PROVISION COMBINATION OF LEMON AROMATHERAPY AND WARM GINGER DRINK FOR REDUCING NAUSEA AND VOMITING TO PREGNANT WOMEN IN FIRST TRIMESTER

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Abstract

Nausea and vomiting is an usual phenomenon and common in the first trimester of pregnancy. Nausea usually occurs in the morning, but also can occur at night or any time. This can occur in the first four weeks to the twelfth week of pregnancy. Management of nausea and vomiting during pregnancy can be done with pharmacological and non-pharmacological therapy. Non-pharmacological therapy to reduce nausea and vomiting are lemon aromatherapy and warm ginger drink. This study aims to determine the Effect Combination of Giving Lemon Aromatherapy and drink warm ginger to reducing nausea and vomiting in first trimester pregnant women at Community Health Center Perumnas Rejang Lebong Regency in 2022. This research used quasi experimental study of pre-posttest design. The population was all pregnant mothers in first semester who experienced emesis gravidarum. The samples were 42 respondents by using permuted blocks technique. Collecting the data was conducted directly through the observation lemon aromatherapy and drink warm ginger 2 times for 4 days questionnaire by PUQE. Data analysis used statistical test of paired t-test and t-test. The result of the study before and after intervention of showed that the score was $\chi^2 = 0.000$ ($\chi^2 < 0.05$), there was an effect combination of lemon aromatherapy and drink warm ginger on nausea and vomiting in pregnant women. Provision Combination of Lemon Aromatherapy and drink warm ginger more effective can reduced nausea and vomiting and the severity of nausea and vomiting in pregnant women.

Keywords: Lemon aromatherapy, Ginger drink, Nausea, Pregnancy, Vomiting

1. Introduction

Pregnancy is a natural process for every woman. During pregnancy, anatomical and physiological changes occur, in addition to these changes, pregnant women experience discomfort during pregnancy such as fatigue, vaginal discharge, cravings, frequent urination and emesis gravidarum. Emesis gravidarum or morning sickness is a term used in the medical world which means nausea and vomiting (Rusman, Andiani, & Fakultas Ilmu Kesehatan, 2017).

Nausea and vomiting in pregnant women occur during the first trimester of pregnancy. As many as 50-75% of pregnant women will experience symptoms of nausea and vomiting in the first trimester or early pregnancy. Nausea usually occurs in the morning, but can also occur at night or any time. These symptoms occur approximately after 6 weeks from the first day of the last menstrual period and last for approximately 10 weeks. Nausea and vomiting occur in 60-80% of primigravida and 40-60% occur in multigravida (Prawirohardjo, 2016).

Nausea and vomiting cause a decrease in appetite so there is a change in the electrolyte balance with potassium, calcium and sodium which causes changes in body metabolism. The occurrence of nausea and vomiting is influenced by the lifestyle of the mother-to-be, as well as the diet of the mother-to-be before and in the early weeks of pregnancy. Studies show that mothers-to-be who eat foods that are high in protein but low in carbohydrates and vitamin B6 are more likely to suffer from severe nausea. The severity of nausea is also related to the lifestyle of the mother-to-be. Lack of food, lack of sleep or rest, and stress can make nausea worse (Prawirohardjo, 2016).

Nausea and vomiting will increase in weight to excessive nausea and vomiting causing the mother to vomit continuously every time she drinks or eats as a result the mother's body is very weak. The face is pale, the frequency of urination decreases drastically so that body fluids are reduced and the blood becomes thick (haemoconcentration). It can slow down blood circulation which means the consumption of oxygen and food to the tissues is also reduced, lack of food and oxygen will cause tissue damage that can endanger the health of the mother and the development of the fetus it contains (Carolin, Syamsiah, & Yuniati, 2020).

The cause of nausea and vomiting in pregnancy is due to an increase in the hormone estrogen and high levels of Human Chorionic Gonadotropin (hCG). The physiological effect of this hormone increase is not known for certain, this may be due to the central nervous system or the reduced emptying of the stomach. The impact of nausea and vomiting can interfere with the mother's daily activities, fatigue in pregnant women, nutritional disorders, dehydration and weight loss. How to overcome nausea and vomiting in pregnant women can be done with pharmacological drugs such as vitamin B6, but the use of these pharmacological drugs sometimes gives side effects such as headaches, diarrhea and tiredness. (Medforth, Battersby, Evans, Marsh, & Walker, 2015). A non-pharmacological way to overcome nausea and vomiting in pregnant women is to use aromatherapy, one of which aroma that can be use is lemon aromatherapy (Cholifah & Nuriyanah, 2018) and ginger decoction (Harahap, Dani, Alamanda, Harefa, & Indonesia, 2020).

Aromatherapy is a technique of using essential oils from plants that are used intensively to prevent or treat disease, reduce stress, or improve health status both physically and psychologically. Lemon aromatherapy derived from the extraction of lemon peel (Citrus Lemon) is one type of aromatherapy that is safe for pregnancy and childbirth. The results of Oktavia et al's research stated that there was an effect of lemon aromatherapy in reducing emesis gravidarum of pregnant women in the first trimester. Lemon aromatherapy had an effect on reducing emesis gravidarum,(Oktavia, Susanti, & Anggalia, 2018).

Another non-pharmacological method that can reduce nausea and vomiting in pregnant women is ginger decoction. Ginger is a plant with a million goods that have been known for a long time. The first advantage of ginger is that it contains essential oils that have a refreshing effect and block the vomit reflex, while gingerol can smooth the blood and nerves work well. The results of Rusman et al's study stated that the administration of ginger boiled water was effective in reducing the level of nausea and vomiting of pregnant women in the first trimester. Ginger acts as a barrier to serotonin, a chemical that can cause the stomach to contract and cause nausea. The combination of lemon and peppermint aromatherapy can reduce the intensity of mild to moderate nausea and vomiting during pregnancy (Rusman et al., 2017).

In a study that compared the efficacy of ginger with other herbal medicines, giving ginger was said to be more effective than inhaling lemon to reduce complaints of nausea and vomiting in pregnancy. This is because ginger contains more active substances than lemon. Research comparing ginger stew with mint leaves can also be concluded that respondents who were given ginger decoction showed more significant differences compared to respondents who were given mint leaf decoction. However, giving ginger decoction will be even more effective when combined with pyridoxine administration compared to just consuming ginger stew or pyridoxine alone (Parwitasari, Utami, & Rahmalia, 2015). So that researchers are interested in conducting research by combining ginger decoction and lemon aromatherapy to reduce complaints of nausea and vomiting in pregnancy.

Based on data at the Curup Hospital, Rejang Lebong Regency, the incidence of pregnant women with Hyperemesis Gravidarum in 2019 was 57 people, and in 2020 as many as 63 people. The results of the initial survey at the Independent Midwife Practice (PBM) in the Work Area of the Perumnas Public Health Center obtained data that there were 53 first trimester pregnant women who experienced mild hyperemesis gravidarum and 181 first trimester pregnant women with complaints of nausea and vomiting. This study aims to determine the effect of Lemon Aromatherapy and Ginger Decoction on Emesis Gravidarum in Primigravida Trimester I.

2. Materials and Methods

The study used a Quasy-experimental design with a two group pretest-posttest design. The research population was all first trimester pregnant women in the Work Area of the Public Health Center of Perumnas, Rejang Lebong Regency, Bengkulu Province. The research sample was pregnant women in the first trimester who complained of nausea and vomiting in the Work Area of the Public Health Center of Perumnas, Rejang Lebong Regency, Bengkulu Province. The research time is May – August 2022. The research sample was selected using the random permuted blocks technique. Determination of the number of samples using the large sample formula according to Lameshow with a total sample of 42 respondents consisting of 21 people for the intervention group and 21 people for the control group. Sample inclusion criteria: 1st trimester pregnant women experience nausea and vomiting, do not suffer from olfactory disorders, not allergic to lemon aromatherapy, willing to be a respondent. Exclusion criteria for samples of pregnant women with digestive tract disorders (gastritis).

This research used Instrument Pregnancy-Unique Quantification of Emesis and Nausea (PUQE) scoring system. PUQE24 is a scoring system to measure the severity of nausea and vomiting of pregnancy in 24 hours. The PUQE score for each respondent was calculated using three criteria to assess the severity of nausea and vomiting during pregnancy (number of hours of feeling nauseated, number of episodes of vomiting, and number of episodes of dry vomiting in the last 24 hours).

In the intervention group, respondents were given an intervention of 100 ml of aromatherapy solution mixed with 30 drops of lemon essential oil using a diffuser for 30 minutes, and a ginger decoction made of 2.5 mg of sliced red ginger, boiled with 250 ml of water until it boils, add a spoon granulated sugar is drunk while warm, given 2 times a day in the morning and evening for 4 days and also given a booklet. In the control group, health education was given using leaflets to reduce nausea and vomiting. Measurement of nausea and vomiting score using the PUQE24 questionnaire was carried out before the intervention and on day 5, after 4 days of the intervention. This research has received approval from the Research Ethics Committee of the Bengkulu Ministry of Health Poltekkes with No. KEPK.M/082/02/2022.

3. Results and Discussion

The characteristics of the subjects in this study include age, education and occupation. The characteristics of the research subjects in the two groups are presented in the following table:

Table 1 Characteristics of Respondents

Characteristic Variables	Frequency		p value*
	N	%	
1 Age			0.484
Age < 20 and > 35	11	26.2	
20-35 years old	31	73.8	
2 Education			0.454
Low	9	21.4	
Tall	33	78.6	
3 Work			1,000
Working	27	64.3	
Doesn't work	15	35.7	

* *Chi-Square test*

Table 1 shows that more than half of the respondents are aged 20-35 years (73.8%), more than half are highly educated (78.6%) and more than half are not working (64.3%). The results of the analysis using chi square show that in both research groups not showing meaningful difference ($p > 0.05$) so that the two groups are said to be homogeneous and worth comparing.

The age of 20-35 years is the productive age range which should be the most ideal age for reproduction so that the ability to breastfeed is also considered the most optimal. The age above 35 years is an age with a high risk of pregnancy and childbirth, so it is considered that the ability to breastfeed has also decreased along with the aging of organ systems. Meanwhile, at the age of less than 20 years, the reproductive organs are still in their infancy (immature). Nausea and vomiting occur at the age of under 20 years and above 35 years occur due to psychological factors. Psychological problems may predict some women to experience nausea and vomiting in pregnancy, or worsen existing symptoms or reduce the ability to manage with symptoms. The results of the research by Rudiyantri and Rosmadewi (2019) stated that there was a statistically significant relationship between age and emesis gravidarum. Based on the results of the analysis, the value of OR = 3.167, it means that respondents who have a risky age have a 3,167 times chance of

experiencing abnormal emesis gravidarum compared to respondents who are not at risk.(Rudiyanti & Rosmadewi, 2019). This is also supported by the research of Periselo and Semangga (2022) which stated that there was a relationship between age and the incidence of hyperemesis gravidarum.(Periselo & Semmangga, 2022).

A person's education affects his knowledge and mother's mindset so that the mother has a fairly high absorption of information, on the contrary, low or less education can delay the development of a person's attitude towards the new values introduced so that knowledge is also lacking. The results of Susilawati and Evasari's research (2017) state that there is a statistically significant relationship between education and the incidence of hyperemesis gravidarum with an OR value of 3.626, meaning that mothers with low education have almost 3 times greater risk of experiencing hyperemesis gravidarum compared to mothers with higher education. (Susilawati & Erlyna Evasari, 2017).

Work is anything that can be valued in terms of earnings. Hyperemesis gravidarum greatly affects the work of pregnant women who work outside the home, so they lose time at work. It is very likely that women who are afraid of losing their jobs are thought to be a factor in the incidence of hyperemia gravidarum (Manuaba, 2019). The results of the research by Periselo and Semanggan (2022) stated that there was a significant relationship between work and the incidence of hyperemesis gravidarum. Psychologically, respondents who do not work have a much higher level of anxiety and stress (IRT), because of the difficulty of living that only relies on their husband's income and responsibilities as housewives are greater in the household, routinely doing tedious homework, causing conflict. mental health related to psychological factors as a triggering factor for hyperemesis gravidarum (Periselo & Semangga, 2022).

Table.2 The mean score of emesis gravidarum in the intervention and control groups

Variable	Intervention Mean ± SD	Control Mean ± SD
Pre	9.52±1.123	9.57±1.535
Post	4.67±1.155	8.48±1.250

Based on table 2, it shows that the average score of emesis gravidarum in the intervention group before giving lemon aromatherapy and ginger decoction was 9.52 and after the intervention was 4.67. In the control group the score before was 9.57 and the post score was 8.48. Bivariate analysis was conducted to examine the relationship between two variables. The results of the data normality test using Shapiro Wilk obtained a p value > 0.05, which means that the data is normally distributed, then the dependent T test is carried out, presented in the following table:

Table 3 Difference in the mean score of emesis gravidarum

Variable	mean	SD	SE	t	mean diff	95% CI		p value
						Lower	Upper	
Pre Score								
Interventio n	9.52	1.123	0.245	0.115	0.048	0.8	0.8	0.909
Control	9.57	1.535	0.335					

Post Score								
Interventio	4.67	1,155	0.252	10.26	3,810	4.5	3.0	0.000
n	8.48	1,250	0.273					
Control								

* *T-Test*

Table 3 shows that there is a significant difference in the mean score of emesis gravidarum between the intervention group and the control group after the intervention with $p = 0.000$. Statistically using the T-test showed that there was a significant difference between the intervention group and the control group with a p value <0.05 , this means that there is an effect of lemon aromatherapy and ginger decoction on emesis gravidarum.

Nausea and vomiting during pregnancy can be caused by changes in the endocrine system that occur during pregnancy, mainly due to high fluctuations in hCG levels, especially because the most common period of gestational nausea or vomiting is in the first 12-16 weeks, so that hCG is the highest level secreted by trophoblast cells. hCG can be secreted in a woman's blood from about three weeks' gestation (ie one week after fertilization), and an increase in the amount of placental tissue also increases the total hours of early pregnancy nausea. hCG is responsible for the decrease in TSH (thyroid stimulating hormone) which often occurs in women with hyper emesis gravidarum who have been shown to have increased thyroid function.(Tyrant, 2019).

The increase in the hormone *estrogen* will stimulate an increase in stomach acid so that it will cause symptoms of emesis gravidarum, and the hormone *estrogen* will inhibit the workings of the *kinureninase* enzyme that affects *tryptophan*. In the mechanism of nausea and vomiting, *tryptophan* functions to secrete serotonin and niacin, so that the five senses are more sensitive and nausea and vomiting will occur more easily. The increase in the hormone *estrogen* will of course also increase the hormone progesterone which will affect the decrease in intestinal peristalsis so that it can cause symptoms of emesis gravidarum.(Manuaba, 2019).

The impact that occurs if pregnant women experience emesis gravidarum continuously will result in reduced body fluids, so that the mother's blood becomes thick (haemoconcentration) and blood circulation to the tissues is delayed. This will cause tissue damage that can interfere with maternal health and fetal development. In addition, emesis gravidarum can cause the mother to feel weak and lose weight, so that it can also disrupt the growth of the fetus in the womb. Continuous emesis gravidarum can threaten the life of the mother and cause fatal disorders such as abortion, low birth weight, premature birth, and malformations in new-borns. (Rinata & Ardillah, 2017).

Aromatherapy is an alternative medicine method that uses vapours of essential oils from various plants that can be inhaled to cure various conditions. In general, aromatherapy is done for the purpose of improving mood, changing cognitive areas, and can also be used as an additional medicine (Naristiyanti, 2019). Aromatherapy is a therapeutic action using essential oils that are useful for improving physical and psychological conditions so that they become better. Each essential oil has a unique pharmacological effect, such as antibacterial, antiviral, diuretic, vasodilator, sedative, and adrenal stimulating. When essential oils are inhaled, the molecules enter the nasal cavity and stimulate the limbic system in the brain. The limbic system is an area that affects emotion and memory and is directly related to the adrenals, pituitary gland,

hypothalamus, the parts of the body that regulate heart rate, blood pressure, stress, memory, hormone balance, and breathing. (Runiari, 2015).

Lemon aromatherapy is one type of herbal oil that is often used to treat nausea and vomiting because it is safe for pregnancy. Lemon contains limonene which will inhibit the work of prostaglandins so that it can reduce pain and can reduce nausea and vomiting. Geranyl Acetate in lemon aromatherapy is one of the monoterpenoid compounds that cause odour. Smells at the lowest basic level, can stimulate the body to respond physically and psychologically. When inhaled, aromatic substances emit biomolecules that stimulate receptor cells in the nose to send impulses directly to the senses of smell in the brain. Immediately the impulse stimulates to release hormones that are able to calm and cause feelings about and affect a person's physical and mental changes so that it can reduce nausea and vomiting (Runiari, 2015).

The content of linalyl acetate in lemon aromatherapy functions to normalize emotional states and unbalanced body conditions and has properties as a sedative and tonic, especially in the nervous system. Lemon has an influence in reducing emesis gravidarum apart from the way aromatherapy works which directly works on the nervous system and is mucosotropic it is also due to the use of aromatherapy which is easy and simple so that pregnant women can use aromatherapy anytime and anywhere to reduce the emesis gravidarum they feel.(Yunis, Ningsih, & Oktavia, 2021). Lemon aromatherapy was also shown to be effective in reducing symptoms of nausea and vomiting by around 39.6%. Previous studies found that the content in lemon, namely essential oil, is an alternative non-pharmacological treatment that is effective in reducing nausea and vomiting in pregnant women (Kia, Safajou, Shahnazi, & Nazemiyeh, 2014).

Another complementary therapy with herbal or traditional plants that can be easily obtained to reduce complaints of nausea in pregnant women is ginger (Ulfah & Sugiati, 2020). Ginger contains essential oils of Zingiberena (zingirona), zingiberol, bisabilena, curcumin, gingerol, flandrena, vitamin A and bitter resins that can block serotonin, a neurotransmitter that is synthesized in the neuroserotonergic neurons in the central nervous system and enterochromaffin cells. In the digestive tract so that it is believed to be able to give a feeling of comfort in the stomach so that it is believed to give a feeling of comfort in the stomach so that it can overcome nausea and vomiting (J.Ramadhan, 2013).

The mechanism of reducing hyperemesis gravidarum with additional warm ginger steeping is the content of natural compounds, namely potassium, magnesium and vitamin B6 (pyridoxine) in ginger which is able to provide carminative properties, namely anti-bloating properties by removing excess gas in the digestive system, so the content of these natural compounds can reduce nausea and vomiting in pregnant women by preventing bloating as a trigger for nausea and vomiting. The main content of ginger, namely gingerol, is a natural compound that can block serotonin, which is a messenger compound for nausea and vomiting, so that if it is blocked, it will reduce nausea and vomiting by increasing relaxation in the digestive organs. (Lazdia & Putri, 2020).

Ginger is also a strong aromatic stimulant that can control vomiting by increasing intestinal peristalsis so that it can increase the body's digestibility so that the stimulation of nausea and vomiting can be reduced. So, it can be concluded that Ginger has all the "secretory" effects or "excreting" effects in this case ginger is anti-bloating, then ginger also has antimyetic properties by blocking serotonin as a messenger of nausea so as to increase relaxation in the digestive organs, and ginger has aromatic properties. which can increase intestinal peristalsis and all the properties of the ginger content are able to improve the performance of the digestive system so that the frequency of nausea and vomiting can be reduced(Lazdia & Putri, 2020).

The results of the research by Lazdia and Putri (2020) stated that the addition of the intervention by giving warm ginger was able to reduce the intensity of hyperemesis gravidarum in 4 days of intervention much better when compared to the control group, namely the group that was only given pharmacological management. (Lazdia & Putri, 2020).

Carolin et al (2020) conducted a study on lemon citrus aromatherapy using a tissue that had been given 3 drops of lemon and inhaled for 5 minutes and repeated twice a day for 7 days using the PUQE instrument. The results showed that there was a reduction in the average score of nausea and vomiting in pregnant women by 3.17 (Carolin et al., 2020). Harahap et al examined the effect of giving ginger boiled water to reduce nausea and vomiting in pregnant women in the first trimester with a 4-day intervention using the PUQE instrument, there was a decrease in the average score of nausea and vomiting in pregnant women by 4.80 (Harahap et al., 2020). Ginger and lemon essential oil is equally effective in reducing nausea and vomiting among pregnant women with mean score 1,67 and 1,33 after intervention (Kustriyanti & Putri, 2019). The combination of giving lemon aromatherapy and ginger decoction 2 times a day for 4 days was proven to be effective in reducing nausea and vomiting complaints of pregnant women in the first trimester with an average score of 4.85.

The researcher assumes that when inhaling aromatherapy, volatile molecules will carry the aromatic elements contained in the oil to the top of the nose. Vibrating hairs contained in it, which function as receptors, will deliver electrochemical messages to the central nervous system. This message will activate a person's emotional and memory center which in turn will send messages back throughout the body through the circulatory system. Messages sent throughout the body will be converted into one action with the release of neurochemical substances in the form of feelings of pleasure, relaxation, calm, or excitement and accompanied by drinking ginger decoction which has a direct effect on the digestive tract and absorption of toxins and acids, because the content of substances in ginger can block serotonin, a neurotransmitter in the central nervous system and enterochromaffin cells. Thus, blocking the induction of HCG into the stomach so that it is more effective in reducing complaints of emesis gravidarum.

Conclusion

Giving a combination of lemon aromatherapy and warm ginger decoction is effective for reducing complaints of nausea and vomiting in first trimester pregnant women. Complementary midwifery care by giving lemon aromatherapy and warm ginger stew can be given by midwives to improve midwifery care in first trimester pregnant women.

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