



The effectiveness of aromatherapy combination of pepperlav (peppermint and lavender) to relieve nausea vomiting in pregnant women

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ABSTRAK

Latar Belakang : Mual dan muntah pada ibu hamil trimester I dapat menyebabkan gejala distress dan stress prenatal yang akan mempengaruhi kualitas hidup seorang ibu. Mual muntah juga akan berpengaruh terhadap asupan gizi pada ibu dan janin. Kebutuhan gizi yang tidak tercukupi sejak awal kehamilan dapat menyebabkan fetal growth restriction yang akan dapat menimbulkan komplikasi jangka pendek dan panjang serta berdampak buruk pada kualitas hidup.

Tujuan : Penelitian ini bertujuan untuk menguji produk aromaterapi kombinasi Pepperlav (peppermint dan lavender) pada ibu hamil untuk meredakan mual dan muntah.

Metode : Penelitian ini menggunakan metode pretest - posttest control group design dengan total sampel 40 ibu hamil TM I yang mengalami mual muntah. Penelitian ini dilakukan di Praktek Mandiri Bidan wilayah Bantul. Pengumpulan data dilakukan dengan wawancara dan pengisian kuesioner yang mengukur mual muntah sebelum intervensi dan sesudah intervensi. Kuesioner yang digunakan adalah RINVR yang valid dan reliabel. Intervensi yang dilakukan dengan pemberian aromaterapi kombinasi Pepperlav dengan formulasi F1B (40:50:10), F2B (30:60:10), F3B (20:70:10) dengan based note VCO yang telah memenuhi uji stabilitas fisik, homogenitas, pengukuran PH, uji daya sebar dan lekat, uji keamanan produk dan uji kesukaan yang dilakukan pada perempuan yang tidak hamil. Data dianalisis menggunakan Uji Paired t Test.

Hasil : Berdasarkan uji statistik dengan analisis Uji Paired t Test nilai $p : 0.001$, hal ini menunjukkan bahwa nilai $p < 0.05$, ada efek yang signifikan pada pemberian aromaterapi pepperlav pada formulasi F1B (kombinasi 40% peppermint, 50% Lavender dan 10% VCO).

Kesimpulan : Aromaterapi kombinasi Pepperlav (peppermint dan lavender) dapat meredakan mual muntah pada ibu hamil

KATA KUNCI : mual dan muntah; aromaterapi; peppermint ; lavender

ABSTRACT

Background : Nausea and vomiting in first trimester pregnant women can cause symptoms of prenatal distress and stress which will affect a mother's quality of life. Nausea and vomiting will also affect the nutritional intake of the mother and fetus. Nutritional needs that are not fulfilled from the beginning of pregnancy can cause fetal growth restriction which can cause short and long term complications and have a negative impact on quality of life.

Objectives : This research aims to test the combination aromatherapy product Pepperlav (Peppermint and Lavender) in pregnant women to relieve nausea and vomiting.

Methods : This study pretest-posttest control group design method with a total sample of 40 first trimester pregnant women who experienced nausea and vomiting. This research was conducted at the Midwife Independent Practice in the Bantul Region. Data collection was carried out by interviewing and filling out questionnaires that measured nausea and vomiting before and after the intervention. The questionnaire used is a valid and reliable RINVR. Intervention were carried out by administering Pepperlav Aromatherapy Combinations with formulations F1B (40:50:10), F2B (30:60:10), F3B (20:70:10) with VCO based notes that have fulfilled the physical stability, homogeneity, measurement PH, spreadability and adhesion tests, product safety tests and preference tests conducted on women who are not pregnant. Data were analyzed using the Paired t Test.

Results : Based on statistical tests with Paired t test analysis p value: 0.001, this shows that the p value <0.05, there is a significant effect on the administration of pepperlav aromatherapy in Formula 1 formulation (a combination of 40% peppermint, 50% Lavender and 10% VCO).

Conclusions : Aromatherapy combination of Pepperlav (peppermint and lavender) can relieve nausea and vomiting in pregnant women.

KEYWORD: nausea and vomiting; aromatherapy; peppermint; lavender

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INTRODUCTION

Nausea and vomiting in pregnant women or emesis gravidarum is a condition of nausea which is sometimes accompanied by vomiting about 5 times a day. The percentage of pregnant women who experience nausea and vomiting is 80% of the total pregnant women in the world. The condition of nausea and vomiting in pregnant women can affect the fetus and the behavior and emotions of the mother during pregnancy (1). Based on research by Mei-Chun Liu in 2019, the most significant figure compared to trimesters 2 and 3 is that pregnant women who experience nausea and vomiting in the first trimester will cause symptoms of prenatal distress and stress which will affect a mother's quality of life(2). The condition of nausea and vomiting affects the nutrients absorbed by the fetus. The nutritional well-being of the fetus in the

womb is very important to pay attention to during pregnancy. Insufficient nutritional needs from the beginning of pregnancy can cause fetal growth restriction (a condition in which the fetus fails to reach the growth potential determined by genetic makeup). Fetal growth hormone conditions can lead to significant short-term and long-term complications and can have a negative impact on quality of life(3).

Reducing effort for nausea and vomiting in the first trimester of pregnancy is very important. So far, prevention of nausea and vomiting for pregnant women uses synthetic drugs or a mixture of drugs and vitamins, where the use of synthetic drugs can cause side effects. Only 29.5% of pregnant women receive non-pharmacotherapy (4). Most antiemetics for pregnant women should

not be consumed by pregnant women with a gestational age of less than 12 weeks because it can increase the risk of developing disorders and fetal growth (5). Attempt to relieve nausea and vomiting in pregnant women can be formulated aromatherapy inhalation preparations from natural ingredients. Aromatherapy preparations can be an alternative therapy because they can improve a person's physical and psychological condition for the better. Some essential oils can provide unique pharmacological effects such as calming, stimulating adrenaline, as anti-bacterial, antiviral, diuretic and vasodilator. Essential chemical molecules that are suspended in essential oils when inhaled through the nasal cavity can stimulate the limbic system in the brain (6). It is hoped that the use of natural ingredients for the prevention of nausea and vomiting of pregnant women can reduce the condition of nausea and vomiting and that the nutrition of mothers and babies since the beginning of pregnancy is completely fulfilled. The solution offered to pregnant women who experience nausea and vomiting is inhaled aromatherapy preparations, which are a combination formulation of peppermint oil and lavender oil.

Peppermint is included in the top notes class and lavender is included in the middle notes essential oil class, where in the aromatherapy formulation it is necessary to pay attention to making the right composition of the aromatherapy formula / blended essential oil preparation (7). Research by R. Hunt et al., (2013) states that inhaling mixed essential oils will minimize episodes of nausea and vomiting among pregnant women (8). Inhaling mixed essential oils will increase energy levels among pregnant women who

have nausea and vomiting, and can minimize the condition. Fatigue among pregnant women experiencing nausea and vomiting. Inhaling two blends of lavender and peppermint oil can minimize the severity of episodes of nausea, increase energy levels and reduce the sensation of fatigue (9). Peppermint with the scientific name *Mentha piperita* L. is an aromatic plant in the Lamiaceae family. Herbal therapists use it as an antispasmodic, carminative, antiemetic, lactation enhancer, sedative, and for the treatment of respiratory and urinary tract infections, morning sickness, dysmenorrhea, diarrhea, and diabetes (10). Peppermint contains 1,8-Cineol and menthol compounds. Peppermint is a monoterpene extracted from mint oil, *Mentha* spp (11).

Peppermint oil in the British Herbal Pharmacopoeia mentions its benefits as a treatment for morning sickness. Aromatherapy is used to relieve pain, depression, insomnia and fatigue, using oils present in various parts of the plant such as *Lavandula angustifolia* (10). Lavender with the scientific name *Lavandula* is a plant from the Lamiaceae family, native to the western Mediterranean region. Lavender contains linalool, linalylacetat, 1,8 – Cineole B- oncimene, terpinen-4-ol, and camphor. Linalool is a lavender content that affects the body's neuroendocrine system which affects the release of hormones and neurotransmitters (6). Lipophilic monoterpene compounds against cell membranes, and cause changes in the activity of ion channels, carriers and nerve receptors. These properties may explain the calming effect of Lavender oil (12).

N. Joulaeerad, et al., (2017) examined

a mixture of peppermint and lavender oil in pregnant women, in this study the method used to manufacture aromatherapy preparations in this study was different. Aromatherapy liniment oil preparations prior to the study on first trimester pregnant women, were carried out on healthy and nonpregnant women for hedonic and irritation tests. Panelists were given inhalations in the form of aromatherapy liniment oil and a hedonic test questionnaire about the level of preference. The formulation is sure to pass the physical stability, hedonic and product safety tests. The combination of pepperlav (peppermint and lavender) aromatherapy has good physical stability, namely no change in color, shape, and smell. The results of the homogeneity test for the combined essential oils can be mixed and do not experience in compatibility and for the PH of degree of acidity of this formulation is 5 so its safe for the skin (13). Based on this, the researchers aim to provide a combination of pepperlav aromatherapy (peppermint and lavender) in the hope that it can relieve nausea and vomiting in first trimester pregnant women.

MATERIALS AND METHODS

The research method used was Quasi Experimental with a non-equivalent pretest and posttest control group design. This design is used to determine differences in nausea and vomiting in pregnant women before and after being given pepperlav aromatherapy according to the formula that has been made. Respondents in this study were 40 respondents who were taken by purposive sampling technique in the independent practice of midwives in Bantul district. Inclusion criteria for respondents included: first trimester pregnant women, namely gestational age less than 12 weeks, experiencing nausea and vomiting, not currently suffering from comorbidities, not smoking. Exclusion criteria in this study were mothers who were not willing to be respondents and at the time of the study the respondents withdrew their consent.

This study used a glass tool (pyrex), mortar and stamper, glass bottles with caps, roll on glass bottles. The materials used in this study were Peppermint oil, Lavender oil, Patchouli oil, and VCO (virgin coconut oil), universal pH, hedonic test questionnaire, anti-

Table 1. Combination formula peppermint oil, lavender and vco oil for aromatherapy, nausea and vomiting

Pepperlav Liniment Oil (ml)	Formula Aromatherapy PepperLav (%)		
	Formula 1	Formula 2	Formula 3
Peppermint Oil (Top Notes)	40	30	20
Lavender Oil (Middle Notes)	50	60	70
VCO Oil (Base Notes)	10	10	10
Total Volume Liniment (ml)	10 ml	10 ml	10 ml

Information: Formula 1 = Combination formula for top notes 40%, middle notes 50%, and base notes 10% Formula 2 = Combination formula for top notes 30%, middle notes 60%, and base notes 10% Formula 3 = Combination formula for top notes 20%, middle notes 70%, and base notes 10%

nausea and vomiting effectiveness test and irritation test.

The preparation and physical stability test of the combination peppermint and lavender liniment oil preparation was carried out at the Pharmacy & Phytochemical Technology Laboratory of the University of Alma Ata. The hedonic test, the irritation test for the combination dosage of peppermint and lavender liniment oil, and the effectiveness of pepperlav aromatherapy against nausea and vomiting in TM I pregnant women were carried out by the Midwives Practice (PMB) Bantul Yogyakarta Region. Hedonic and irritation tests were performed on women who were not pregnant.

Data collection was carried out in October - early December 2020. Data collection was assisted by 2 research assistants, namely practicing midwives, whose perceptions had previously been carried out by researchers. Clinical trials on respondents were carried out directly with a random random system on 40 pregnant women who were met. Before being given pepperlav aromatherapy respondents were given questionnaires and conducted interviews based on the Rhodes Index Nausea, Vomiting & Retching (RINVR) questionnaire to measure nausea and vomiting before and after the intervention. RINVR is valid and reliable for measuring nausea and vomiting based on previous studies. There are 5 categories of nausea, namely 0 (normal), 1-8 (mild nausea), 9-16 (moderate vomiting nausea), 17-24 (severe vomiting nausea) and 25-32 (very severe nausea and vomiting). Furthermore, respondents knew that they would receive a treatment, namely aromatherapy, but these

respondents did not know the size of the pepperlav formulation they received. Respondents will be given pepperlav aromatherapy and a monitoring sheet containing measurements of nausea and vomiting which will be filled in by the respondent for 3 days using aromatherapy. How to use aromatherapy by inhaling pepperlav aromatherapy preparations when the respondent feels nausea and vomiting. Of the 40 pregnant women, there were 4 groups, 3 groups for the intervention giving Formula 1, Formula 2 and Formula 3 and 1 group was not given therapy as a comparison.

The data that has been collected was analyzed using SPSS with Paired t Test analysis test with a 95% confidence interval. This research has received approval from the ethical commission of Alma Ata University with No. KE/AA /IX/10305a/EC/2020. All respondents of this study had signed informed consent.

RESULT AND DISCUSSION

RESULT

Physical Stability Test, Irritation Test and Hedonic / Likeability Test

The test results of the physical properties of the aromatherapy liniment oil with variations in the combination of peppermint and lavender with VCO base notes consisted of organoleptic observations, there was no change in shape or texture, color and odor, the homogeneity test was that the Pepperlav formulation could be mixed well, the pH measurement results were within 5- 6, the spreadability test results are susceptible to 6.3-7.6, the adhesion test <5 seconds shows that the adhesion of the preparation is not good, this does not affect the function of the

preparation in this study because in this study it was used by inhalation. For the test results the volume transferred is stable, the volume is the same after repeated 6 ml. The results of all the irritation tests provided that both did not cause irritation to the skin of the panelists

(there was no hyperemia, erythema, and edema or skin vesicles) and for the hedonic / preference test, most respondents liked the Formula 1 formulation with a combination of peppermint 40%:lavender 50%:VCO 10%.

Characteristics of Respondents

Table 2. Characteristics of first trimester pregnant women who experience nausea and vomiting at PMB Nurul Apri and PMB Umu Hani

Category	Classification	Amount (N)	Percentage (%)
Age	<20 Years	0	0
	20-35 Years	36	90
	>35 Years	4	10
Last Education	SD	1	2.5
	SMP	1	2.5
	SMK	26	65
	D3/S1	12	30
Parity	Primigravida	26	65
	Multigravida	14	35
	Grandemultigravida	0	0
Work	Housewives	25	62.5
	Self - employed	3	7.5
	Employee	8	20
	Teacher	3	7.5
	Student	1	2.5
Total Respondents (N) : 40			

The characteristics of TM I pregnant women who experience nausea and vomiting in PMB Midwives Practice Nurul Apri and PMB Midwives Practice Umu Hani : based on age are mostly in the category of healthy reproduction, namely 36 respondents (90%), most of whom have a vocational/high school education, namely 26 respondents (65%), no grandemultigravida (0%) and most of them are housewives namely 25 respondents (62.5%) and there is 1 respondent with student status (2.5%).

Categories of Oral and Vomiting

Nausea and vomiting were

categorized using the Rhodes Index of Nausea Vomiting and Retching (RINVR). Based on data collection carried out by questionnaires and interviews, the levels of nausea and vomiting of pregnant women in this study can be described in Table 3.

Effectiveness of Peppervlav Aromatherapy Preparations Against Nausea and Vomiting of Pregnant Women Trimester I

The peppervlav aromatherapy formulation that was tested on pregnant women was formulated with a VCO oil base note consisting of 3 formulations, namely

Table 3. Levels of nausea and vomiting for pregnant women in Trimester I at PMB Nurul Apri and Umu Hani

Category Classification Before Treatment		Percentage (%)	After Treatment	Percentage (%)
Level of Nausea	Normal	0	5	12.5
	Severe	23	25	62.5
	Moderate	16	9	22.5
	Weight	1	1	2.5
	Very heavy	0	0	0
	Total (N)	40	40	100

Formula 1, Formula 2 and Formula 3, while the F1A, F2A, and F3A preparations were not tested on pregnant women because they were based on the hedonic test results. Most of them dislike the aroma resulting from the peppermint, lavender and patchouli oil formulations. The effectiveness test of pepperlav aromatherapy preparations was carried out by giving one aromatherapy preparation formulation to pregnant women who experienced nausea and vomiting randomly, each preparation was given to 10 pregnant women. Furthermore, there were 10 pregnant women who had been assessed for nausea and vomiting but were not given aromatherapy preparations. This group was used as the comparison group. To determine the effectiveness, measurements of nausea and vomiting were carried out before and after the intervention for each group. Based on statistical data analysis using *Paired T-test*

analysis (14), the results of the effectiveness test of inhaled pepperlav aromatherapy on nausea and vomiting of TM I pregnant women were obtained in Table 4.

Based on the results of statistical tests using SPSS with *Paired t Test* analysis, it was found that the t count in the Formula 1 formulation was 4,946, indicating that before giving aromatherapy the level of nausea and vomiting of pregnant women was greater than after being given aromatherapy for Formula 1 formulation. A significant formulation to reduce nausea and vomiting in pregnant women is the Formula 1 formulation with a significant value (p) $0.001 < 0.05$. Based on table 8 the significant value (p) for Formula 2, Formula 3 and untreated formulations is > 0.05 . This shows that the Formula 2 and Formula 3 formulations do not provide a significant change in nausea and vomiting of pregnant women.

Table 4. Statistical test results on the effectiveness of aromatherapy pepperlav inhalation against nausea and vomiting of Trimester I pregnant women

	Paired Differences		t	df	Sig. (2-tailed)
	Mean	Std. Deviation			
PreFormula 1 - PostFormula 1	6.1000	3.9001	4.946	9	.001
PreFormula 2 - PostFormula 2	.6000	3.3731	.562	9	.588
PreFormula 3 - PostFormula 3	2.3000	4.0565	1.793	9	.107
Pre - PostNoInterv	.6000	.6992	2.714	9	.024

DISCUSSION

The results showed that most pregnant women felt nausea and vomiting. The level of nausea felt by mothers varies. In this study, most of the mothers experienced moderate to severe nausea and vomiting. Factors that influence nausea and vomiting in pregnant women, namely pregnancy status, namely primigravida and work status of housewives(15), whereas for the mother's education level did not affect the incidence of nausea and vomiting (16). Employment status is not yet clear because it is possible for the mother not to work after experiencing nausea and vomiting. Nausea and vomiting that occurs in pregnant women can be felt by mothers for a long time influenced by several things including mothers who are not working, teenage age, lack of activity, lack of exercise, often drinking cold, history of gastrointestinal pain (17). Medicinal methods of prevention and treatment include nutritional supplements and alternative methods, such as hypnosis and acupuncture, as well as pharmacotherapy (5). Most of the therapy received by pregnant women with nausea and vomiting is pharmacological therapy, namely by using vitamin B6 and it is necessary to develop non-pharmacological therapies to relieve nausea and vomiting in pregnant women(4).

Researchers do not recommend peppervav aromatherapy with patchouli oil base note because some of the hedonic test respondents did not like the formulation. Respondents felt a very strong and pungent aroma when inhaling peppervav aromatherapy. This is in accordance with the theory put forward by that patchouli oil is to

strengthen the aroma of an aromatherapy formulation karena mengandung 40-60% alcohol (18). Based on the strong aroma, it can increase nausea and vomiting in pregnant women. The aroma of patchouli oil gives it a distinctive woody, sweet and spicy aroma. Most of the respondents liked the peppervav aromatherapy formulation with a base note of VCO oil. This is because VCO does not have a stinging effect and VCO has often been used as a body moisturizer, aromatherapy carrier and hair conditione (19). VCO retains the aroma of a formulation for longer and reduced lipid peroxidation and increase the activity of SOD (20). The smell of VCO has often been felt by most people so that people are more likely to get used to it. Based on this, the peppervav aromatherapy formulation with VCO oil based notes is preferred by pregnant women because it can be useful for suppressing nausea, increasing energy and reducing the sensation of fatigue(9).

Peppermint (*Mentha piperita* L) is an aromatic plant in the Lamiaceae family. Peppermint herbal therapist is used as an antispasmodic, carminative, antiemetic, lactation enhancer, sedative, and for the treatment of respiratory and urinary tract infections, morning sickness, dysmenorrhea, diarrhea, and diabetes (10). Peppermint oil in the British Herbal Pharmacopoeia mentions its use as a treatment for morning sickness. Aromatherapy is used to relieve pain, depression, insomnia and fatigue, using oils found in various parts of the plant such as *Lavandula angustifolia* 3. Lavender with the scientific name *Lavandula* is a plant from the Lamiaceae family, native to the western

Mediterranean region. Lipophilic monoterpene compounds against cell membranes, and cause changes in the activity of ion channels, carriers and nerve receptors. These properties may explain the calming effect of Lavender(12).

Peppermint is included in the top notes class and lavender is included in the middle notes essential oil class, where in the aromatherapy formulation it is necessary to pay attention to making the right composition of the aromatherapy formula / blended essential oil preparation (7). R. Hunt et al. stated that inhaling mixed essential oils will minimize episodes of nausea and vomiting among pregnant women(8)

The most popular and most effective peppervlav aromatherapy preparation in overcoming nausea is the F1 B formula, which is a combination of 40% peppermint: 50% lavender: 10% VCO. In this formulation, it appears that the dominant composition is Lavender, this is because lavender essential oil provides a comfortable, calming effect and increases relaxation, Apleton (2012), in Pande, et al (2013), while peppermint contains menthol (50%) and Menthone (10%-30%) is high, besides peppermint provides a carminative and antispasmodic effect that specifically acts on the smooth muscles of the gastrointestinal tract or digestive tract and throughout the bile. Aromatherapy preparations with this essential oil when inhaled molecules will enter the nasal cavity and stimulate the limbic system in the brain which is an area that affects emotions and memory and directly affects the adrenal glands, pituitary gland, hypothalamus and other body parts that regulate blood pressure,

heart rate, memory stress, respiration and hormonal balance. Giving aromatherapy (lavender and peppermint) can improve mood and energy scores for the better in first trimester pregnant women (9). Both have an anti-depressant effect because of their essential oil content and aromatherapy properties. An essential oil can be used in conjunction with other essential oils and this mixture is called a synergy. Synergy is more effective than one type of essential oil(21).

CONCLUSION AND RECOMMENDATION

Aromatherapy Sedian Peppervlav (Peppermint and Lavender) Inhalation with Formula 1 formulation (40% Peppermint: 50% Lavender: 10% VCO) has a significant effect in reducing nausea and vomiting in pregnant women. The limitations of this study are that the sample used is sufficient and there is less interaction with pregnant women due to adjusting the covid 19 protocol. The results of this study can be used as a recommendation for midwives in providing midwifery care for pregnant women who experience nausea and vomiting and pregnant women can use Peppervlav combination aromatherapy to relieve nausea and vomiting in pregnancy.

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