



**THE EFFECT ON THE FREQUENCY OF EMESIS GRAVIDARUM WITH
MUSA ACUMINATA, CITRUS LEMON AROMATHERAPY AND PC6
POINT OF ACUPUNCTURE**

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ABSTRACT

The prevalence rate of emesis gravidarum in the world is 15%, in Indonesia is 10% in all pregnancies. The results of preliminary studies at Independent Midwifery Practice Sumariyah on February 20, 2024 by interviewing 62 pregnant women the 1st trimester amount of 35 pregnant women (56.4%) experiencing emesis gravidarum. The purpose to analyze the effect on the frequency of emesis gravidarum with musa acuminata, citrus lemon aromatherapy and pc6 point of acupuncture. Method were quasy Experimental Non-Equivalent Control Group design. Accidental sampling technique, samples 16 intervention groups; 16 control groups. Data collection techniques with measure emesis gravidarum before and after 24 hours at aboth group. Instruments using PUQE 24 score questionnaire, observation sheet, pamphlet, data analysed used Wilcoxon. Results after being administration in the intervention group known decrease of intensity of nausea vomiting from 4-6 times becomes 1-3 times (25.0%). After being placebo in control group known still nausea vomiting between 4-6 times (62.5%). P value =0.021 in the intervention group; p=0.317 in the control group. Conclusion that administration of Musa Acuminata, Citrus Lemon Aromatherapy, PC6 Point Acupuncture “de qi” technique is known effective in reducing the frequency of nausea vomiting immediately compared to the control group.

Keywords: Citrus Lemon Aromatherapy; Emesis Gravidarum; Musa Acuminata; PC6 Point Acupuncture

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ABSTRAK

Prevalensi emesis gravidarum di Dunia yaitu 15%, di Indonesia yaitu 10% pada seluruh kehamilan. Hasil studi pendahuluan di Praktik Mandiri Bidan Sumariyah pada 20 Februari 2024 dengan wawancara pada 62 ibu hamil trimester 1 sebanyak 35 ibu hamil (56.4%) mengalami emesis gravidarum. Tujuan untuk menganalisis efek frekuensi mual muntah dengan *Musa Acuminata*, *Citrus Lemon Aromatherapy*, Akupuntur titik PC6. Desain *Quasy Experimental Non-Equivalent Control Group*. Teknik *Accidental sampling*, sampel 16 kelompok intervensi; 16 kelompok kontrol. Teknik pengumpulan data dengan mengukur emesis gravidarum sebelum dan sesudah 24 jam pada kedua kelompok. Instrumen menggunakan kuesioner PUQE 24 skor, lembar observasi, pamphlet, analisis data menggunakan Wilcoxon. Hasil setelah diberikan intervensi pada kelompok intervensi diketahui intensitas mual muntah menurun dari 4-6 kali menjadi 1-3 kali (25.0%). Setelah diberikan plasebo pada kelompok kontrol diketahui masih mual muntah antara 4-6 kali (62.5%). Nilai $p=0.021$ pada kelompok intervensi; $p=0.317$ pada kelompok kontrol. Kesimpulan yaitu intervensi pemberian *Musa Acuminata*, *Citrus Lemon Aromatherapy*, Akupuntur PC6 Point teknik "de qi" diketahui efektif dalam menurunkan frekuensi mual muntah dengan segera dibandingkan kelompok kontrol.

Kata kunci: *Aromaterapi Lemon; Emesis Gravidarum; Pisang Ambon; Akupuntur Titik PC6*

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INTRODUCTION

One of the physical complications experienced by pregnant women is the incidence of nausea and vomiting or called emesis gravidarum (Munjiah *et al.*, 2015). Emesis gravidarum is a physiological nausea and vomiting condition experienced by pregnant women (morning sickness) usually occurs in the 1st trimester and can progress to hyperemesis gravidarum in 1-2% of pregnant women (Khairani & Putri, 2022); (Lu *et al.*, 2021). Emesis gravidarum rarely causes death. The incidence is most common at 5-12 weeks (Heuvel *et al.*, 2016); and will stop at 16 weeks of gestation (Yanuaringsih *et al.*, 2020).

The incidence of nausea and vomiting in the world is 70-80%, while the incidence of emesis gravidarum according to the World Health Organization (WHO) in the world is 15%, and in Indonesia is about 10% in all pregnancies (Purwanti *et al.*, 2022). The results of preliminary studies at Sumariyah Independent Midwife Practice on February 20, 2024 with interviews there were 62 pregnant women (November 2023-February 2024) with 35 pregnant women in the 1st trimester (56.4%) experiencing emesis gravidarum. Factors causing emesis gravidarum due to increased levels of estrogen, progesterone, chorionic gonadotropin hormone (HCG) in placental serum. Other factors are stress, parity, unwanted pregnancy which can exacerbate nausea and vomiting in pregnant women; culture, socioeconomics, vitamin B deficiency, thyroid dysfunction, lifestyle (Lu *et al.*, 2021); food consumption factors that allow nausea and vomiting (Kiswati, 2017).

The impact was weight loss >5% which can end up being chronic energy deficiency (CED), dehydration, acidosis, ketosis, negative effects on relationships with family (Heuvel *et al.*, 2016). About 25% progress to hyperemesis gravidarum, depression (Munjiah *et al.*, 2015); hemoconcentration, increasing the risk of pre-eclampsia, solusio placental. The impact on the fetus is abortion, LBW, prematurity, newborn malformations, reduced fetal insulin sensitivity, IUGR (Ratih & Qomariah, 2017) and (Solechah & Kartini, 2020).

The treatment can be done pharmacologically and non-pharmacologically. Pharmacological therapy is known to have greater side effects than non-pharmacological, especially when used in the 1st trimester of pregnancy. A relatively safe pharmacological therapy that can be given to pregnant

women is the administration of vitamin B6. Other side effects are changes in plasma volume, intestinal motility, glomerular filtration, and the impact on fetal development (Sumah *et al.*, 2021). Therefore, the treatment can use non-pharmacological therapy that is relatively safer. The types of therapy are *musa acuminata*, citrus lemon aromatherapy, and PC6 point acupuncture which functions to increase metabolic absorption and reduce nausea and vomiting.

Musa acuminata fruit functions to reduce nausea and vomiting, its main compounds is vitamin B6, neutralizes stomach acid and improves the digestive system. *Musa acuminata* fruit approximately fulfills 15% of adult vitamin B6 needs (Kiswati, 2017). Aromatherapy essential oils to help maintain health, raise spirits, and calm the body and soul. Citrus lemon is one of the most widely used herbal oils in pregnancy (Afriyanti & Rahendza, 2020). Furthermore, acupuncture therapy according to several studies is known to be effective in reducing nausea and vomiting in pregnant women. One of the acupoints PC6 have functions to block abnormal energy flows and reduce the intensity of nausea and vomiting (Munjiah *et al.*, 2015). The purpose was to analyze to analyze the effect on the frequency of emesis gravidarum with *musa acuminata*, citrus lemon aromatherapy and pc6 point of acupuncture.

METHOD

Participant characteristics and research design

Characteristics participant in this study was measure from age, education level, employment, income, and Gravidarum. The research design used quasi experimental with non-equivalent control group design. Inclusion criteria was the 1st trimester pregnant women with emesis gravidarum, willing to be studied, present during the study, living in the working area of Sumariyah Independent Midwife Practice. Exclusion criteria: the 2nd and the 3rd trimester pregnant women, hyperemesis gravidarum.

Sampling procedures

It was using Accidental sampling technique. It means that the respondents who happen to meet the inclusion criteria are then included as participants in this study.

Sample size, power, and precision

The population were all pregnant women in 1st Trimester of 35 participants who experienced emesis gravidarum at Sumariyah Independent Midwife Practice Sawojajar Malang in November 2023-February 2024. The sample in control group were 16 participants and intervention group were 16 participants (Frederer formula).

Measurement and Collecting Data

We had given a questionnaire about demographic data to participants and explaining how to fill it in both groups, use the PUQE questionnaire in two groups. Intervene in the intervention group (16 participants) by interventions in the form of *musa acuminata* 2 times a day for 1 day and citrus lemon aromatherapy 2 times a day for 10 minutes in each intervention with a duration of 1 day and utilizing the media pamphlet "**Fruit and Aromatherapy Prevent Nausea and Vomiting**", given acupuncture therapy point PC6 (Neiguan) for 10 minutes for 1 day, inserting acupuncture needle until "de qi" technique was retained for 10 minutes and recorded on the observation sheet. In the control group, 16 pregnant women were given placebo in the form of vitamin B6 3x10 mg for 1 day and superficial acupuncture technique no "de qi" sensation was sought but the needle was twisted slightly every 10 minutes per day for 1 day and recorded on the observation sheet. Checking the intensity of nausea and vomiting using the PUQE sheet in both groups by measuring it after 24 hours of intervention, namely on day 2 and recording the results.

Data analysis

Data analysis for univariable was using descriptive frequency dan data analysis bivariabile was using the Wilcoxon Sign Rank using SPSS v.16.0.

RESULTS AND DISCUSSION

RESULT

The results of this study will explain the factors that affect and do not affect emesis gravidarum and the frequency distribution of emesis gravidarum in both intervention and control groups.

Tabel 1 The Characteristics of Respondents

Variables	Frequency	Percentage (%)	Mean; SD; Min.; Max.
Age (years old)			Mean= 26,91; SD= 4,283;
<20	0	0.0	Min.= 20 years old; Max.= 38
20-35	30	93.8	years old
>35	2	6.2	
Education Level			
Elementary School	1	3.1	
Junior High School	3	9.4	
High School	25	78.1	
College	3	9.4	
Employment			
Housewives	21	65.6	
Entrepreneur	4	12.5	
Private Employee	7	21.9	
Farmer	0	0.0	
Civil Servant	0	0.0	
Income			
≤1 million	7	21.9	
>1-3 million	18	56.2	
>3 million	7	21.9	
Gravidarum			
Primigravida	19	59.4	
Multigravida	13	40.6	
Grandemulti	0	0.0	
Frequency of Emesis Gravidarum on Pregnant Women Before Treatment			Mean= 1,81; SD= 0,834;
1-3 times	7	43.8	Min.= 1-3 times; Max.= 7-13 times
4-6 times	5	31.2	
7-13 times	4	25.0	
Frequency of Emesis Gravidarum on Pregnant Women After Treatment			Mean= 1,25; SD= 0,577;
1-3 times	13	81.2	Min.= 1-3 times; Max.= 7-13 times
4-6 times	2	12.5	
7-13 times	1	6.2	
Frequency of Emesis Gravidarum on Pregnant Women Before Placebo Administration			Mean= 1,69; SD= 0,479;
1-3 times	5	31.2	Min.= 1-3 times; Max.= 4-6 times
4-6 times	11	68.8	
7-13 times	0	0.0	
Frequency of Emesis Gravidarum on Pregnant Women After Placebo Administration			Mean= 1,62; SD= 0,500;
1-3 times	6	37.5	Min.= 1-3 times; Max.= 4-6 times
4-6 times	10	62.5	
≥7 times	0	0.0	

Total	32	100.0
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Source: Primary Data, 2024

Table 2 Cross Table of the Association between the Frequency of Emesis Gravidarum of Pregnant Women in the Intervention Group

Frequency of Emesis Gravidarum Before Intervention	Frequency of Emesis Gravidarum After Intervention						Total	
	1-3 times		4-6 times		7-13 times		f	%
	f	%	f	%	f	%		
1-3 times	7	43.8	0	0.0	0	0.0	7	43.8
4-6 times	4	25.0	0	0.0	1	6.2	5	31.2
7-13 times	2	12.5	2	12.5	0	0.0	4	25.0
Sum	13	81.2	2	12.5	1	6.2	16	100.0

Wilcoxon Sign Rank Test result was $p=0.021 < \alpha 0.05$

Source: Primary Data, 2024

Table 3 Cross Table of the Association between the Frequency of Emesis Gravidarum of Pregnant Women in the Control Group

Frequency of Emesis Gravidarum Before Placebo Administration	Frequency of Emesis Gravidarum After Placebo Administration						Total	
	1-3 times		4-6 times		7-13 times		f	%
	f	%	f	%	f	%		
1-3 times	5	31.2	0	0.0	0	0.0	5	31.2
4-6 times	1	6.2	10	62.5	0	0.0	11	68.8
7-13 times	0	0.0	0	0.0	0	0.0	0	0.0
Sum	6	37.5	10	62.5	0	0.0	16	100.0

Wilcoxon Sign Rank Test result was $p=0.317 > \alpha 0.05$

Source: Primary Data, 2024

In this study from 16 pregnant women participants before and after given intervention that frequency of emesis gravidarum before intervention were 4-6 times and after intervention were decrease of the frequency become 1-3 times, then frequency of 7-13 times before intervention become 4-6 times after intervention and then the result of Wilcoxon Sign Rank Test in the intervention group was significant ($p < \alpha 0.05$) (Table 2.). It means that the intervention giving effect in reduce frequency of emesis gravidarum.

Additionally, from 16 pregnant women participants before given administration a placebo in the control group shows that majority in the frequency of emesis gravidarum were 4-6 times and after administration a placebo were still between 4-6 times and the frequency of 1-3 times before and after administration a placebo were 31.2%, then the result of Wilcoxon Sign Rank Test was not significant ($p > \alpha 0.05$) (Table 3.).

DISCUSSION

The Effectiveness of Musa Acuminata Intervention, Citrus Lemon Aromatherapy and PC6 Point Acupuncture toward Frequency of Emesis Gravidarum as Prevention of Chronic Energy Deficiency

The results of this study shows that intervention of musa acuminata, citrus lemon aromatherapy, PC6 pont acupuncture significant influence toward decrease of frequency of emesis gravidarum immediately as prevention of chronic energy deficiency, meanwhile administration only vitamin B6 Emesis gravidarum is nausea and vomiting that occurs in pregnancy, usually occurs in the 1st trimester

(morning sickness) (Veri *et al.*, 2020); (Dinberu *et al.*, 2019). However, the results of this study apply to the researched areas with similar characteristics.

It is the most common complaint that occurs in pregnant women, especially primigravida mothers, due to the adaptability of HCG and estrogen which cause complaints in the form of nausea and vomiting and the lack of psychological adaptability (Riyanto & Nissa, 2019). The mechanism of HCG can cause nausea and vomiting in pregnant women, namely the process of activating secretion in the upper gastro intestine and stimulating increased formation of thyroid hormones by HCG. In addition, high estrogen levels in pregnant women will have a side effect on the gastro intestinal tract, namely the intestinal transit time becomes slower and hinders gastric emptying. This is what causes nausea and vomiting in pregnant women (DA, 2021).

Symptoms of emesis gravidarum can start from mild symptoms to severe symptoms or called hyperemesis gravidarum with characteristics ranging from decreased consciousness, disrupting daily activities so that treatment is required through secondary health facilities that have complete facilities (Jannah *et al.*, 2021), (Suryaningrum *et al.*, 2019). Factors causing emesis gravidarum include increased levels of estrogen and progesterone hormones and HCG in placental serum. Other factors are psychological factors such as stress, parity, unwanted pregnancy which can impact nausea and vomiting (Munjiah *et al.*, 2015). Other causes include culture, socio-economic, vitamin B deficiency, thyroid dysfunction, lifestyle (Lu *et al.*, 2021); food consumption factors that allow nausea and vomiting (Kiswati, 2017). The next factor is the age factor of being too young <20 years and too old >38 years when pregnant for the first time which is associated with physical and psychological readiness to face changes during pregnancy caused by hormonal changes, then work factors can also affect emesis gravidarum (Agustin *et al.*, 2024). Pregnant women who work are known to be able to adapt more easily because work can function as a distraction technique.

The first factors is level of education as the results of this study in table 1 showed that the minimum age of pregnant women is 20 years old and the maximum is 38 years old with an average age of 26.91 years old. Pregnant women who older are known to experience a decrease in the function of various systems in the body including the reproductive system. Pregnant women whose first pregnancy age is >35 years old are known to have a higher stress response compared to pregnant women aged 20-35 years old. This can stimulate the hypothalamus and stimulate the vomiting center that occurs in the brain (Aryasih *et al.*, 2022); (Husna *et al.*, 2022).

The second factor is level of education. It is the majority of participants had a high school education of 78.1% (table 1). The level of education of an individual can indirectly affect the ability to accept and understand discomfort during pregnancy as well as the paradigm and selection of adaptive or maladaptive coping strategies and health seeking behavior (Aryasih *et al.*, 2022); (Rahmawati *et al.*, 2022).

The third factor is employment. They have employment as housewives as many as 65.6%. Employment can indirectly affect the frequency of emesis gravidarum. Pregnant women who have employment as housewives have less extensive social circles so that they have less information in handling emesis gravidarum (Rahmawati *et al.*, 2022). The fourth factor is income. The results showed that most have an income of >1-3 million as many as 56.2% (table 1). The prevalence of pregnant women in countries with low incomes has a higher prevalence compared to developed countries. It will affect the emotional response of pregnant women because the physical needs including nutrition of pregnant women may not be met. This triggers to increase of nausea and vomiting (Dinberu *et al.*, 2019), (Fauziah *et al.*, 2022).

The fifth factor is gravidarum. The results are primigravida as many as 59.4%. Gravidarum can affects the incidence of emesis gravidarum. In primigravida mothers, pregnant women didn't have able to

adapt well to changes in the HCG and experience about pregnancy and discomfort in the form of nausea and vomiting (Ratih & Qomariah, 2017); (Rahmawati *et al.*, 2022).

Efforts made to overcome emesis gravidarum by non-pharmacologically (Khairani and Putri, 2022) dan (Veri *et al.*, 2020). The Musa Paradiaca or Musa Acuminata can reduce the intensity of emesis gravidarum (Khairani and Putri, 2022), (Shanti, Barokah, and Rahayu, 2018). It contain vitamin B6, vitamin C, Fe minerals, flavonoid which help the formation of immune substances, metabolism process, erythrocyte formation, and hemoglobin stimulation. One of the anti-emetic contents (vitamin B6) which is very high at 0.5 mg in every 100 grams helps reduce emesis gravidarum (Desmariyenti, 2022). The daily of vitamin B6 in pregnant women is approximately 1.8 mg per day and can be given an intervention in the form of 2-3 Musa Acuminata and other foods which contain vitamin B6 (Molisa *et al.*, 2020).

Next, the administration of citrus lemon aromatherapy in the study was proven to reduce the frequency of emesis gravidarum. The aroma released from citrus lemon contains linalool which plays a role in stabilizing the nervous system which provides a calming effect when inhaled by pregnant women. The relaxation function of citrus lemon emits biomolecules, receptor cells in the nose then send signals to the olfactory function in the brain, which is closely related to other systems related to memory control, emotional control, sex hormone control and heart rate (Afriyanti & Rahendza, 2020). The next intervention was the administration of PC6 point acupuncture therapy with the "de qi" technique. The results of this study had proven effective in helping pregnant women to reduce emesis gravidarum, but with the same characteristics. The principle of acupuncture treatment stimulates meridian points that play a role in the release of adenocorticotropin hormone (ACTH) from the pituitary. ACTH stimulates the adrenals to produce cortisol which is antiemetic. Acupuncture performed at point PC 6 will block the abnormal energy flow. The stimulation effect at this point is believed to increase the release of beta-endorphin in the pituitary and ACTH along the chemoreceptor trigger zone (CTZ) which can inhibit the vomiting center (Munjiah *et al.*, 2015), (Nahdiana, N., Siti, 2023).

LIMITATION OF THE STUDY

Limitation this study is the duration of the intervention is measured only in 24 hours and the research only conducted one observation at the midwifery's private practice and did not observe the patient at home while the patient was eating musa acuminata or inhaling citrus lemon aromatherapy. Additionally, the sample size was small. It means influence in generalization of the result of this study, and sampling technique not used randomized so may result in selection sample bias.

CONCLUSIONS AND SUGGESTIONS

The intervention of administration Musa Acuminata, Citrus Lemon Aromatherapy and PC6 Point Acupuncture (Neiguan) using "de qi" technique in the intervention group was found to be effective in reducing the frequency of emesis gravidarum immediately compared the control group with administration a placebo of Vitamin B6 and Superficial PC6 Point Acupuncture technique. Additionally, more factor that influence of emesis gravidarum is education level, employment, income, gravida.

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ETHICAL CONSIDERATIONS

Ethical feasibility tests approval by Universitas Hafshawaty Zainul Hasan with Code number: 315/KEPK-UNHASA/VIII/2024.

Conflict of Interest Statement

All authors declare that no conflict of interest.

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