

**THE EFFECT OF ACUPRESSUR THERAPY IN REDUCING NAUSEA AND  
VOMITING PREGNANT WOMEN TRIMESTER I : QUASI-EXPERIMENTAL  
STUDY**

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***Original article***

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**Abstract**

**Introduction.** Nausea and vomiting are the most common symptoms experienced by pregnant women in the first trimester, and these symptoms are experienced by 70-85% of women. Nausea and vomiting are often experienced by pregnant women, especially in the first trimester, affecting about 50-80% of pregnant women. Management of nausea and vomiting in pregnancy consists of pharmacological and non-pharmacological. This study aims to analyze the effect of acupressure therapy on nausea and vomiting.

**Methods.** This type of research is a quasi-experimental design using a two-group pre-post design involving 30 first trimester pregnant women who experience nausea and vomiting selected by purposive sampling. The criteria for the participants were gestational age at 10-16 weeks and maternal age at 20-35 years (productive age), while mothers taking nausea and vomiting drugs were excluded from this study. Data analysis used the Wilcoxon test and Mann-Whitney test.

**Results.** a significant decrease group with p-value  $<0.05$ . Based on the Mann Whitney test, it was found that the p-value for the pre in the frequency of moderat nausea and vomiting scores before and after acupressure in the intervention -test ( $<0.0001$ ), and the post-test was 0.55, post test scores showed no difference between the two study groups.

**Conclusion.** The study shows encouraging signs about reducing the frequency of nausea and vomiting in first-trimester pregnant women, so this therapy can be used as an alternative intervention for pregnant women who experience nausea and vomiting.

**Keywords:** Acupressure, Nausea Vomiting, Pregnant Women, Non-pharmacological Therapy

## Introduction

Pregnancy is fertilization or joining of spermatozoa and ovum, so nidation or implantation occurs [1]. According to the international calendar, from the time of fertilization until the birth of the baby, pregnancy will generally last 40 weeks or ten months [2,3]. The signs and symptoms of pregnancy include nausea without vomiting, micturition disorders, and fatigue [4]. Nausea occurs due to increased hormone estrogen and chorionic gonadotropin hormone (HCG) in the serum [5]. The physiological changes of this hormone increase are not yet apparent, perhaps due to stimulation of the central nervous system or gastric emptying that is not optimal [6]. A study in Indonesia revealed that pregnant women with nausea and vomiting reached 14.8% of all pregnancies. Complaints of nausea and vomiting occur in 60-80% of primigravida and 40-60% of multiple pregnancies [7]. The coverage of First Prenatal Visits in Jambi Province reached 10-15% of the 73,096 pregnant women in 2018 [8]. According to the Jambi City Health Office data, the number of pregnant women who had a First Prenatal Visit in Jambi City was 76,681 (74.9%) [8]. If nausea and vomiting in pregnancy do not treat immediately, it will impair fetal growth, fetal death and congenital abnormalities. The consequences for the mother are dehydration, acid-base balance disorders, and potassium deficiency [9]. Management of nausea and vomiting in pregnancy consists of pharmacological and non-pharmacological. Diet settings, emotional support and acupressure are options in non-pharmacological therapy which effective as an intervention to treat nausea [10]. Acupressure is a healing technique by pressing and massaging certain body parts to reactivate the energy balance in the mother's body due to adaptation to changes during pregnancy. Acupressure, especially at the pericardial point, can achieve balance in the mother's body [11]. In treating nausea and vomiting in pregnancy, acupressure carries out three fingers above the middle of the inner wrist and four fingers below the kneecap on the outer edge of the shinbone [12]. Acupressure is found to be effective in reducing nausea and

vomiting through the mechanism of increasing beta endorphins. This substance is one of the natural anti-emetics that can reduce the vomiting stimulus in the CTZ (Chemoreceptor Trigger Zone) and the vomiting center which in turn can reduce nausea and vomiting [12].

A meta-analysis of acupuncture in pediatric tonsillectomy revealed that the number of patients with Postoperative Nausea and Vomiting was significantly reduced with acupuncture compared to the control group, with a risk ratio of 0.77 (95% confidence interval: 0.63–0.94,  $p < 0.05$ ) [13]. A study in the Maternity and Child Hospital in Istanbul reported that acupressure would appear to be effective in symptom control, and alleviation and placebo effects in reducing the symptoms of nausea and vomiting during pregnancy [14]. Previous studies have not mapped the characteristics of nausea and vomiting severity in pregnant women. Therefore, in this study, we analyzed the effect of acupressure therapy in reducing moderate nausea and vomiting in the working area of the Talang Banjar Health Center, Jambi City.

## **Methods**

### **Design**

This study uses a two group with pretest-posttest design where the design provides a pretest before being treated and a posttest after being treated in each group [15]. This quasy-experimental study used two group with pretest-posttest design.

### **Participants**

The criteria for the participants were gestational age at 10-16 weeks and maternal age at 20-35 years (productive age), while mothers taking nausea and vomiting drugs were excluded from this study.

**Intervention**

Acupressure therapy performs for three days for each pregnant woman. First, measurements of maternal nausea and vomiting provide, then acupressure therapy was performed. Massage performed on three fingers above the wrist in a circular motion and on four fingers below the kneecap on the outer edge of the shin, given emphasis as much as 30 times. This therapy conducts for 5 minutes every morning. At the end of the 4th-day therapy session, maternal nausea and vomiting measured. The interpretation of the results of the PUQE measurement is severe, if the score is  $\geq 13$ , moderate if the score is 7-12, and mild if the score is  $\leq 6$ . The measurement of nausea and vomiting used Pregnancy Unique Quantification of Emesis and Nausea (PUQE). The Pregnancy-Unique Quantification of Emesis and Nausea (PUQE) scoring system instrument is a research instrument developed by Koren *et al.* [16] and validated by Koren *et al.* [17].

**Outcomes**

The outcome of the study is that pregnant women are expected to show a decrease in the frequency of nausea and vomiting

**Sample size**

Involving 30 first trimester pregnant women who were divided into 2 groups, 15 pregnant women experienced moderate nausea and vomiting (score 7-10) and 15 pregnant women experienced moderate nausea and vomiting (score 10-12).

**Randomisation (Sequence generation, Allocation etc)**

The selection of research samples was carried out at simple random

**Blinding**

The included samples were selected blindly

**Ethical Consideration**

No economic incentives were offered or provided for participation in this study. The study was performed in accordance with the ethical considerations of the Helsinki Declaration. This study obtained ethical feasibility under the Health Research Ethics Commission of the Ministry of Health, Jambi, and registration number: LB.02.06/2/54/2020.

**Statistical analysis**

There are 2 data analyses used, namely univariate analysis to describe the characteristics of pregnant women (age, education level, and occupation of pregnant women) and a description of the frequency of nausea and vomiting before and after the intervention. Data are presented as numbers and percentages for categorical variables. Continuous data are expressed as the mean  $\pm$  standard deviation (SD), or median with Interquartile Range (IQR). Then proceed with bivariate analysis using the Wilcoxon test and the Mann Whitney test. The Wilcoxon test was used to determine the effect of acupressure therapy on reducing nausea and vomiting in each study group, while the Mann Whitney test was used to determine differences in nausea and vomiting between the two study groups. All tests with p-value ( $p$ ) $<0.05$  were considered significant. Statistical analysis performed using the SPSS app version 16.0.

**Results**

The characteristics of respondents in this study include age, education level, occupation, gestational age, and parity.

The following is a table of the frequency distribution of the characteristics of the respondents in this study:

Characteristics	Eksperiment groups			
	Group 1		Group 2	
	n	%	n	%
<b>Age</b>				
20-30 y.o	12	53.2	14	93.3
30-40 y.o	3	46.8	1	6.7
<b>Education Level</b>				
High (> High School)	13	86.7	2	13.3
Low (< High School)	2	13.3	13	86.7
<b>Occupation</b>				
Merchant	1	6.7	1	6.7
Housewives	9	60	8	53.3
Civil servant/Army/police	4	26.6	4	26.7
Entrepreneur	1	6.7	2	13.3
<b>Gestasional age</b>				
1-4 week	0	0	0	0
5-8 week	6	40	10	66.7
9-12 week	9	60	5	33.3
<b>Parity</b>				
1	4	26.7	3	20
>1	11	73.3	12	80

**Table 1.** *Frequency Distribution of Respondents' Characteristics*

Table 1 shows that most of the respondents in Group 2 aged 20-30 years were 14 people (93.3%), and respondents aged 30-40 years were 1 (6.7%) people. The majority of respondents in group 1, as many as 13 (86.7%), have high education, namely high school graduates or more (college), and as many as two people (13.3%) have low education (< high school). At work, most of the respondents in Group 1 are housewives; 9 (60%) and 1 (6.7%) respondents were traders and entrepreneurs. At gestational age, most of the respondents in group 1 had a gestational age of 9-12 weeks, namely 9 (60%), and as many as 6 (40%) respondents had a gestational age of 5-8 weeks. In the parity aspect, some respondents in group 2 had parity > 1, namely 12 (80%) respondents and 3 (20%) had parity 1.

The results of measuring nausea and vomiting in the Group 1 and Group 2 prior to acupressure therapy using the PUQE scale can be seen in the following table:

Question	PUQE scale	Group 1		Group 2	
		Pre-test n (%)	Post-test n (%)	Pre-test n (%)	Post-test n (%)
In the last 24 hours, for how long have you had nausea and vomiting or abdominal discomfort, and have you been vomiting?	score scale 5	0 (0.0)	2 (13.3)	0 (0.0)	1 (6.7)
	Score scale 6	0 (0.0)	13 (86.7)	0 (0.0)	14 (93.3)
	Score scale 7	3 (20)	0 (0.0)	0 (0.0)	0 (0.0)
	Score scale 8	2 (13.3)	0 (0.0)	0 (0.0)	0 (0.0)
	Score scale 9	6 (40)	0 (0.0)	0 (0.0)	0 (0.0)
	Score scale 10	4 (26.7)	0 (0.0)	9 (60)	0 (0.0)
	Score scale 11		0 (0.0)	5 (33.3)	0 (0.0)
	Score scale 12		0 (0.0)	1 (6.7)	0 (0.0)
Mean±SD		8.73±1.09	5.87± 0.35	10.50±0.64	5.93±0.26
Median(IRQ)		9 (8-9.5)	6 (6-6)	10 (10-11)	6 (6-6)

**Table 2.** Results of the PUQE Scale for Respondents in the Group 1 and Group 2 Before and After Acupressure in First Trimester Pregnant Women

Table 2 shows, Group 1, as many as 6 (40%) respondents with a score of 9, 4 (26.7%) respondents had a score of 10, 3 (20%) respondents had a score of 7, and 2 (13.3%) respondents had score 8. After acupressure therapy, the nausea and vomiting score scale decreased to 13 (86.7%) in the last 24 hours experiencing nausea and vomiting with a score of 6 (mild nausea and vomiting), and as many as 2 (13.3%) respondents in The last 24 hours experienced vomiting with a score of 5 (mild nausea and vomiting). Group 2, 9 (60%) respondents experienced nausea and vomiting with a score of 10 in the last 24 hours, 5 (33.3%) respondents experienced nausea and vomiting in the previous 24 hours with a score of 11, and 1 (6.7%) respondents experienced nausea with a score of 12 in the last 24 hours. After doing acupressure therapy, 14 (93.3%) respondents got a PUQE score of 6 and 1 (6.7%) respondents got a score of 5.

The condition of nausea and vomiting before and after the acupressure technique in group 1 and Group 2 can be seen in the table below:

Interventions	N	Wilcoxon test		Mann Whitney test
		Group 1	Group 2	Group 1 vs. Group 2
		Mean±SD Median (IRQ)	Mean±SD Median (IRQ)	
<b>Pre-test</b>	15	8.73±1.09 9 (8-9.5)	10.50±0.64 10 (10-11)	p-value<0.0001
<b>Post-test</b>	15	5.87± 0.35 6 (6-6)	5.93±0.26 6 (6-6)	p-value=0.55
<b>p-value</b>		0.0007	0.0007	

**Table 3.** *Frequency distribution of Group 1 and Group 2 before and after acupressure therapies*

Table 3 shows a significant decrease in the frequency of nausea and vomiting scores in both groups before and after acupressure in the intervention group with p-value <0.05. Based on the Mann Whitney test, it was found that the p-value for the pre-test (<0.0001), and the post-test was 0.55, the post-test value showed no difference between the two research groups.

## Discussion

The result of study showed that patients in the treatment group, who were given acupressure therapy after day 3, had less severity of nausea, frequency of vomiting and the level of intensity of discomfort felt from nausea, when compared to the condition of nausea and vomiting on the first day before treatment. Previous research conducted by O'Brien B [18], Werntoft E [19], and Tara F [20] showed that have reported a reduction in the intensity of nausea and vomiting discomfort during the first trimester of pregnancy.

In group 1, before giving acupressure therapy, the average value of nausea and vomiting was 8.73 and it decreased very significantly after giving acupressure therapy to 5.87, meaning that

there was a decrease of 2.86 points. The same thing was shown by group 2 after acupressure therapy experienced a significant decrease of 4.57 points. The results of this study indicate that acupressure therapy is very effective in reducing nausea and vomiting, especially for pregnant women in the 1st trimester.

The results of the current study have shown the ability of acupressure to significantly reduce acute nausea and vomiting scores in respondents who experience acute nausea and vomiting, so it can be concluded that acupressure is an effective intervention in reducing nausea in pregnant women. This finding is in accordance with previous findings which stated that acupressure is one of the appropriate measures in the management of nausea and vomiting due to pregnancy [11].

In a study conducted in Turkey by Gürkan ÖC [14], it was shown that in subjects undergoing at Neiguan (PC6) acupoint acupressure between days 4–6, there was less severity of nausea, frequency of vomiting, and feeling of discomfort after nausea. Another study by Markose MT [21] showed that the frequency of vomiting, nausea, and retching, as well as the discomfort caused by nausea and vomiting were significantly lower in the at Neiguan (PC6) acupoint pressure treatment group than in the control group under drug therapy. In line with the research of Mojgan Naeimi Rad et al [22] involving 80 first trimester pregnant women concluded that acupressure on KID21 point is more effective than sham acupressure in reduction of nausea and vomiting in pregnancy.

15 respondents experienced nausea and vomiting at a score of 10-12 and after being given acupressure, the score decreased to 5-6, from 15 respondents experienced nausea and vomiting a score of 7-10, after receiving acupressure therapy, the score for nausea and vomiting decreased to a score of 5-6. In group 1, the decrease was lower than in group 2. The cause could be due to stress factors, so that even though acupressure therapy has been given, the frequency of nausea and vomiting can increase again [23]. Psychological factors are

factors that are triggered from the surrounding environment such as work or family problems that make pregnant women stressed, because stress can interfere with the hormonal system of the gastric organs in controlling gastric acid secretion so that stomach acid can increase and cause nausea and vomiting [24,25].

In line with the research of Pirimoglu ZM, et al [26] that pregnant women suffering from hyperemesis gravidarum were identified as 80% afraid of losing their jobs, afraid of getting pregnant again in the future, experiencing psychiatric symptoms such as depression and anxiety. Based on this research, that acupressure therapy is ideally applied to mothers who suffer from emesis or nausea and vomiting on a mild or moderate scale, and as an alternative therapy in reducing nausea and vomiting, especially pregnant women who have a fear of the side effects of medical treatment therapy, such as doubts of the effect of the drug on fetal defects in the womb.

The results of data analysis using the Mann Whitney test to determine differences in nausea and vomiting before (pre) acupressure therapy in the two study groups and differences in nausea and vomiting after (post) acupressure therapy in the two study groups showed that the pre-test of the two study groups had a p-value of 0.0001, which means that there is a difference in the point of nausea and vomiting of the two study groups before acupressure therapy, but after acupressure therapy there is no difference in the scale of nausea and vomiting in the two study groups (p-value = 0.55). there was no significant difference based on the results of statistical data analysis in the two groups after acupressure therapy was most likely strongly influenced by the same type of intervention given to both study groups.

The main limitation of this study is the absence of controlling for other factors that can affect the frequency of nausea and vomiting such as stress, and the type of food consumed by pregnant women, so it is very likely that the variable data measured are less accurate.

**Conclusion**

Acupressure therapy is the choice of pregnant women and is more enjoyable than medical treatment because in addition to being easy and cheap, it is also effective in reducing the frequency of nausea and vomiting in first trimester pregnant women.

**Limitations**

The limitations of this study include a very small sample and the pattern or type of food of pregnant women that was not controlled during the study

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**Competing interests statement**

There are no competing interests for this study.

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