

EFFECTIVENESS OF LIME (*CITRUS AURANTIFOLIA*) COMBINED WITH HONEY ON THE INTENSITY OF NAUSEA AND VOMITING IN 1ST TRIMESTER OF PREGNANT WOMEN

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ABSTRAK : EFEKTIVITAS PEMBERIAN JERUK NIPIS (*CITRUS AURANTIFOLIA*) KOMBINASI MADU TERHADAP INTENSITAS MUAL DAN MUNTAH PADA IBU HAMIL TRIMESTER 1

Latar Belakang: Prevalensi mual muntah di dunia mencapai 70-80 % dari jumlah ibu hamil. Dampak dari mual muntah dapat menyebabkan dehidrasi, masalah nutrisi, ketidakseimbangan elektrolit, penurunan berat badan, yang merupakan penyebab komplikasi pada janin seperti abortus, BBLR, dan kejadian pertumbuhan janin terhambat (Intrauterine growth retardation/IUGR). Penanganannya meliputi terapi farmakologi dan secara non farmakologi dengan pemberian jeruk nipis dan madu yang merupakan salah satu cara terbaik mengatasi mual dan muntah.

Tujuan: Penelitian ini bertujuan untuk menilai efektivitas Pemberian Jeruk Nipis Kombinasi Madu Terhadap Intensitas Mual dan Muntah Pada Ibu Hamil Trimester 1.

Metode: Metode penelitian adalah Quasi-experiment dengan nonequivalent control group design. Populasi penelitian ini adalah seluruh Ibu hamil TM 1 di wilayah kerja Puskesmas Guguk Panjang dengan total populasi sebanyak 58 orang. Jumlah sampelnya diambil secara total sampling sehingga diperoleh kelompok intervensi sebanyak 13 orang dan kelompok kontrol sebanyak 18 orang yang memenuhi kriteria inklusi. Pengumpulan data berlangsung pada bulan Mei-Juni 2025 dengan intervensi 2 kali dalam sehari untuk masing-masing responden. Analisis penelitian menggunakan Wilcoxon dan Mann-Whitney.

Hasil: Ada perbedaan yang signifikan antara kelompok intervensi ($p=0.033$; $\Delta=2.7$) dan kontrol ($p=0.002$; $\Delta=1.6$) dalam penurunan intensitas mual muntah sebelum dan sesudah perlakuan. Hasil uji Mann-Whitney diperoleh nilai $p = 0.005$ ($\alpha=0.05$ atau $p < 0,05$). Hal ini menunjukkan bahwa pemberian jeruk nipis kombinasi madu lebih efektif menurunkan intensitas mual muntah dibandingkan dengan vitamin B6.

Kesimpulan: Pemberian jeruk nipis kombinasi madu lebih efektif dalam menurunkan intensitas mual muntah pada ibu hamil trimester 1 karena adanya kandungan flavonoid dan peridoksin alami dari keduanya. Diharapkan agar terapi komplementer jeruk nipis kombinasi madu dapat menjadi penolong pertama ketika terjadi mual muntah karena mudah diperoleh dan merupakan herbal lokal yang mudah ditemui di Bukittinggi.

Kata Kunci: Intensitas mual-muntah, Jeruk nipis (*Citrus Aurantifolia*), Madu, Vitamin B6

ABSTRACT

Background: The prevalence of nausea and vomiting worldwide reaches 70-80% of pregnant women. The effects of nausea and vomiting can cause dehydration, nutritional problems, electrolyte imbalance, and weight loss, which are causes of complications in the fetus such as abortion, low birth weight, and intrauterine growth retardation (IUGR). Treatment includes pharmacological and non-pharmacological therapies, with the administration of lime and honey being one of the best ways to overcome nausea and vomiting.

Objectives: This study aimed to assess the effectiveness of lime juice combined with honey on the intensity of nausea and vomiting in pregnant women in their first trimester.

Method: The research method was a quasi-experimental study with a nonequivalent control group design. The study population consisted of all pregnant women in their first trimester in the working area of the Guguk Panjang Community Health Center, with a total population of 58 people. The sample size was determined using total sampling, resulting in an intervention group of 13 people and a control group of 18 people who met the inclusion criteria. Data collection took place in May-June 2025 with twice interventions per day for each respondent. The research analysis used Wilcoxon and Mann-Whitney Test.

Results: There was a significant difference between the experimental group ($p=0.033$; $\Delta=2.7$) and the control group ($p=0.002$; $\Delta=1.6$) in the reduction of nausea and vomiting intensity before and after treatment. The

Mann-Whitney test yielded a p-value of 0.005 ($\alpha=0.05$ or $p < 0.05$). This indicates that the combination of lime and honey is more effective in reducing the intensity of nausea and vomiting than vitamin B6.

Conclusion: The administration of lime combined with honey is more effective in reducing the intensity of nausea and vomiting in pregnant women in the first trimester due to the natural flavonoid and pyridoxine content of both. It is hoped that complementary therapy with lime combined with honey can be the first aid when nausea and vomiting occur because it is easily obtained as a local herb that is easily found in Bukittinggi.

Keywords: Intensity of nausea and vomiting, Lime (Citrus Aurantifolia), Honey, Vitamin B6

INTRODUCTION

Pregnancy is the process of fetal development that begins at conception and continues until the birth of the baby. The full-term pregnancy period is 280 days (40 weeks or 9 months and 7 days), calculated from the first day of the mother's last menstrual period (Munthe et al., 2019). In the first trimester, pregnant women usually experience nausea and vomiting, which are normal symptoms of pregnancy. Around the sixth week of pregnancy, nausea and vomiting begin to appear and decrease significantly by the end of the 16th week (Hindratni & Sari, 2022). Emesis Gravidarum is a symptom of nausea accompanied by vomiting that occurs in early pregnancy and, if it worsens, develops into Hyperemesis Gravidarum (Herien, 2024). This dangerous nausea and vomiting is distinguished from normal morning sickness commonly experienced by pregnant women because its intensity exceeds normal vomiting and lasts throughout the first trimester of pregnancy (Khairiah et al., 2017). According to data from the World Health Organization (WHO) in 2017, the number of cases of Hyperemesis Gravidarum reached 12.5% of all pregnancies worldwide (Lubis & Abilowo, 2023). The incidence of nausea and vomiting worldwide reaches 70-80% of pregnant women (Herien, 2024). The main cause of nausea and vomiting is the high increase in Chorionic Gonadotropin (HCG) hormone levels, especially during the period of gestational nausea and vomiting, which most often occurs between the eighteenth and twelfth weeks of pregnancy (Lubis & Abilowo, 2023). The effects of nausea and vomiting can cause dehydration, nutritional problems, electrolyte imbalance, and weight loss, which are causes of complications in the fetus such as miscarriage, low birth weight, and other complications. Pregnant women who experience emesis to the point of hyperemesis gravidarum are more susceptible to intrauterine growth retardation (IUGR) (Soa et al., 2018).

The management of the effects of nausea and vomiting in pregnancy depends on the symptoms experienced. In accordance with

government policy on the management of Hyperemesis Gravidarum in Indonesia, as regulated in Minister of Health Regulation (PMK) Number 5 of 2014, which sets out clinical practice guidelines for doctors in primary health care facilities. Management includes pharmacological therapy such as H2 blockers, pyridoxine (B6), and antiemetics (Mentri Kesehatan RI, 2014). Non-pharmacological approaches include ginger administration, the use of acupressure bracelets, lemon and peppermint aromatherapy, and lime and honey, which are among the best ways to manage nausea and vomiting (Ani & Machfudloh, 2021; Lestari et al., 2022; Pratiwi et al., 2024; Soa et al., 2018). Lime is one of the herbal ingredients used in traditional medicine (Yulia Sari Lubis et al., 2024). Limes contain N-methylamine, flavonoids such as poncirin, hesperidin, rhoifolin, maringin, and synephrine, as well as essential limonene and linalool. Beneficial chemical compounds such as citric acid, citral phellandrene, linalyl acetate, geranyl acetate, and limonene can be found in lime. Lime has flavonoid content that can increase bile production, which will help neutralize digestive fluids and reduce nausea (Aziz et al., 2024). Based on previous research results, there was a significant difference in the intensity of nausea and vomiting between the pre-test and post-test in the group given lime juice and honey ($p\text{-value}=0.002 > \alpha=0.05$) (Soa et al., 2018). Therefore, it can be suggested that administering lime juice can be an effective alternative to reduce nausea and vomiting symptoms in pregnant women (Yulia Sari Lubis et al., 2024). However, there have not been many studies on the combination of lime and honey compared to vitamin B6 consumption (Damayanti & Jannah, 2022; Lubis & Abilowo, 2023). Honey is a herbal ingredient with a sweet and thick texture, ranging in color from golden to dark brown, with high sugar and low fat content (Endry Sulistyowati et al., 2023; Junaidah, 2024).

Based on the limitation of complementary care use the combination of lime and honey compared to vitamin B6. Therefore, the administration of lime juice mixed with honey can be

used as a complementary therapy to reduce nausea and vomiting in pregnant women, the effectiveness of which will be compared with the standard treatment, namely the administration of vitamin B6. In terms of the number of pregnant women with nausea and vomiting, the highest number is found in the working area of the Guguk Panjang Health Center. Based on the above background, the author is interested in conducting research on "The Effectiveness of Lime (Citrus Aurantifolia) Combined with Honey on the Intensity of Nausea and Vomiting in Pregnant Women in the Guguk Panjang Community Health Center Working Area, Bukittinggi City."

RESEARCH METHODS

Population and sample

The research design used was a quasi-experimental design with a nonequivalent control group design. The research was conducted in May-June in the working area of the Guguk Panjang Community Health Center. The population consisted of 58 pregnant women in their first trimester. A total of 31 respondents were obtained according to the inclusion and exclusion criteria. The inclusion criteria in this study were pregnant women in the first trimester who experienced nausea and vomiting, pregnant women in the first trimester who consumed vitamin B6, and mothers who were in a healthy condition. Meanwhile, the exclusion criteria included pregnant women with a history of heartburn or gastrointestinal disorders, pregnant women with gastric acid disease, mothers experiencing influenza, and mothers who withdrew during the research process. Respondents who withdrew during the research process, such as those who did not complete the post-test questionnaire or did not consume the oranges as instructed, were excluded from the study. Therefore, the total sampling with 13 respondents for the intervention group and 18 respondents for the control group consuming vitamin B6.

Intervention Procedure

Based on modification of several previous research, modifications were made to the ingredients required for this treatment experiment, namely 30 ml of lime juice per serving, 1 tablespoon of honey, and 200 ml of warm water (Damayanti & Jannah, 2022; Madiuw et al., 2021; Nurmasyithah et al., 2025). Participants consumed 30 ml of lime juice per serving, equivalent to approximately two tablespoons of freshly squeezed lime juice. This amount was selected because it is generally well tolerated by pregnant women and is considered

safe and practical for consumption during pregnancy when taken in appropriate dilution. The ingredients were mixed in a glass and consumed twice daily in the morning and evening for one day, and on the second day, the intensity of nausea and vomiting was measured. The mixture was sipped, held in the mouth for a moment to mix with saliva, and then swallowed, continuing until it was finished. This was done to give the brain a chance to send feedback to the digestive system. The intervention in this study was conducted for only one day due to limitations in the research timeline and data collection process. As a result, the short duration of the intervention may not fully describe the short-term or long-term therapeutic effects of lime juice on nausea and vomiting during pregnancy. Therefore, the selection of a one-day intervention period should be considered as one of the limitations of this study.

Data collection and analysis

Data collection for observing the severity of nausea and vomiting used the Instrument (PUQE-24) hour-scoring system. The data normality test using Shapiro-Wilk results showed that the data were not normally distributed ($p < 0,05$), then the Wilcoxon and Mann-Whitney tests was used. This research under the approval of Research Ethics Committee Team of Poltekkes Kemenkes Padang with No. EC-008/KEPK-PDG/XII/2025 in 12 December 2025.

RESEARCH RESULTS

Based on research conducted on 31 respondents on the topic of "The Effectiveness of Lime Juice Combined with Honey on the Intensity of Nausea and Vomiting in First Trimester Pregnant Women," the following results were obtained:

Table 1
Intensity of Nausea and Vomiting in First-Trimester Pregnant Women Before and After Being Given Lime Juice Combined with Honey and B6

Group	N	Before			After		
		Mea n	Mi n	Ma x	Mea n	Mi n	Ma x
Intervention	13	9	7	10	6.3	3	8
Control	18	8.33	3	15	6.7	3	15

Table 1 shows that of the 13 respondents, the mean nausea and vomiting score in pregnant women before intervention was 9, with the lowest nausea score being 7 and the highest being 10. Meanwhile, the mean nausea and vomiting score in the 18 respondents in the control group was 8.33, with the lowest nausea and vomiting score being 3 and the highest being 15. Table about After

intervention shows that of the 13 respondents, the mean nausea and vomiting score in pregnant women after intervention was 6.3, with the lowest nausea score being 3 and the highest being 8. Meanwhile, the mean nausea and vomiting score in the 18 respondents in the control group was 6.7, with the lowest nausea and vomiting score being 3 and the highest being 15.

Table 2
Differences in the Intensity of Nausea and Vomiting Before and After in the Intervention Group

Intervention group	N	Mean ±SD (Pretest)	Mean ±SD (Posttest)	Mean Difference	P-value
Pre-test	13	9 ± 0.91	6.3 ± 1.43	2.7	0.033

Based on Table 3, the results of the analysis using the Wilcoxon test can be concluded that in the intervention group, there was a significant difference in the intensity of nausea and vomiting between the pre-test and post-test ($p\text{-value} = 0.033 < \alpha = 0.05$).

Based on Table 4, the results of the analysis using the Wilcoxon test show that in the control group, there was a significant difference in the intensity of nausea and vomiting between the pre-test and post-test ($p\text{-value} = 0.002 > \alpha = 0.05$).

Table 3
Differences in the Intensity of Nausea and Vomiting Before and After in the control group

Control group	N	Mean ±SD (Pretest)	Mean ±SD (Posttest)	Mean Difference	P-value
Pre-test	13	8.3 ± 2.4	6.7 ± 2.7	1.6	0.002

Table 4
Comparison of the Intensity of Nausea and Vomiting After (Posttest) in the Intervention and Control Groups

Group	N	Mean	Mean Difference	P-value
Intervention	13	6.3	0.4	0.005
Control	18	6.7		

DISCUSSION

The Effect of Lime on the Intensity of Nausea and Vomiting

After conducting a Mann-Whitney test based on the statistical results table, a p-value of 0.005 was obtained. Thus, the p-value is smaller than α or 0.05, so H_0 is rejected and H_a is accepted, meaning that there is a difference between the administration of lime juice combined with honey and B6 in reducing the intensity of nausea and vomiting in pregnant women in their first trimester in the Guguk Panjang Community Health Center Working Area. The results of this study are similar to previous studies which stated that there was a significant difference in the intensity of nausea and vomiting between the pre-test and post-test in the group given lime and honey ($p\text{-value} = 0.002 > \alpha = 0.05$) (Soa et al., 2018). Another study with warm lime juice intervention obtained a p-value of 0.000,

which means that consuming warm lime juice is effective in reducing emesis gravidarum in pregnant women in their first trimester (Aziz et al., 2024).

This study was conducted by giving respondents 200 ml of warm solution made from a mixture of lime (30 ml) and honey (1 tablespoon) to be consumed twice a day for a 1-day therapy. The lime and honey used were local herbs from Bukittinggi to support the benefits of authentic Minangkabau herbs. Local Bukittinggi lime has a distinctive sour and slightly bitter taste and is medium in size. Bukittinggi honey comes from local flower nectar around Bukittinggi (such as acacia, rubber, or other flowers depending on the specific location), giving it a distinctive and unique taste and aroma. Another study also states that lime and honey are effective in treating emesis gravidarum ($P=0.000$) with a difference in the method of administration, which was done once a day for 3

consecutive days, measured by the reduction in nausea and vomiting on days 1 and 4 (Yulia Sari Lubis et al., 2024).

Lime is beneficial for strengthening liver tissue and thinning mucus in the digestive tract. Lime contains essential oils, among other compounds. The essential oils in lime consist of citral, limonene, felandrene, lemon camphor, cadinene, geraniol acetate, linalyl acetate, acetaldehyde, and nialdehyde. Essential oils have health benefits, including stabilizing the nervous system, inducing feelings of happiness and calmness, increasing appetite, and healing diseases. Essential oils can also block serotonin, a neurotransmitter synthesized in serotonergic neurons in the central nervous system and enterochromaffin cells in the digestive tract, so it is believed to provide a feeling of comfort in the stomach and can overcome nausea and vomiting (Damayanti & Jannah, 2022). Lime juice can help overcome nausea and vomiting by reducing their frequency. This is because lime juice contains flavonoids, which are serotonin receptor antagonists. Since flavonoids help neutralize acidic digestive fluids and aid in the elimination of toxins, they can stimulate the production of bile, acids, and digestive fluids (Pratiwi et al., 2024).

A study shows that every 100 g of lime (*Citrus Aurantifolia*) contains 164.907 mg of vitamin C, 178.654 mg of flavonoids, 3.454 g of citric acid, and 0.30 mg of vitamin B6. Therefore, this study also states that there is a statistically significant effect at a significance level of $\alpha=0.05$ or $p<0.05$ in overcoming nausea and vomiting during pregnancy (Yulia Sari Lubis et al., 2024). Nausea and vomiting in pregnancy (NVP) is a common condition during pregnancy, especially in the first trimester. This condition is characterized by symptoms of nausea, vomiting, and sometimes dry retching. Although this term is often used to refer to milder symptoms, there is also a more serious condition known as Hyperemesis Gravidarum (HG), which requires further medical attention. The most commonly used criteria for diagnosing HG include persistent vomiting with weight loss unrelated to other causes, as well as signs of acute starvation such as carbohydrate depletion, electrolyte abnormalities, and/or acid-base disturbances (Munthe et al., 2019). Limes also have the ability to stimulate peristaltic movements in the stomach, facilitating smoother digestion of food. Flavonoid compounds, such as naringin, hesperidin, naringenin, hesperitin, rutin, nobiletin, and tangeretin, can be found in lime peel. Limes also contain vitamin B6 (pyridoxine), which acts as a serotonin receptor antagonist. This

function helps reduce nausea and vomiting, which often occur during pregnancy (Lubis & Abilowo, 2023).

The Effect of Honey and its Combination with Lime on the Intensity of Nausea and Vomiting

Honey is the only known source of sweetener that has been used as a remedy. Honey contains several minerals that are important for the body. Some of these substances have benefits for pregnant women, including overcoming morning sickness (Soa et al., 2018). Honey is a sweet liquid that comes from plant nectar that is processed by bees into honey and stored in the cells of the honeycomb. Honey has benefits in various aspects, including food, health, and beauty. Honey is often used as a sweetener, food flavoring, and mixture when consuming beverages. In addition, honey is also often used for medicinal purposes. Honey is a good source of nutrition. Amino acids, carbohydrates, proteins, several types of vitamins and minerals are nutrients in honey that are absorbed by the body's cells (Damayanti & Jannah, 2022). Honey contains several minerals that are important for the body. Honey contains pyridoxine (vitamin B6) as a receptor antagonist and other benefits. Honey can help maintain stamina and health during pregnancy and provide high nutritional intake for fetal growth in the womb (Fazriah et al., 2025).

Based on the findings of previous study indicate that the combination of lime (*Citrus aurantifolia*) and honey was effective in reducing the intensity of nausea and vomiting among first-trimester pregnant women. This result is consistent with another previous studies showing that citrus-based therapies can help alleviate emesis gravidarum through both physiological and psychological mechanisms. Lime combined with honey significantly reduced nausea and vomiting in first-trimester pregnant women. Lime contains vitamin C, flavonoids, and vitamin B6, while honey helps maintain maternal stamina and overall health during pregnancy (Prihartini et al., 2026). Physiologically, nausea and vomiting during pregnancy are associated with increased levels of human chorionic gonadotropin (hCG), estrogen, and progesterone, especially during the first trimester (Fadhila Destya Fatmawati et al., 2025). These hormonal changes can affect gastric motility and increase sensitivity to odors and gastrointestinal stimulation. Lime contains citric acid and essential oils such as limonene and citral, which may stimulate saliva production, improve digestive function, and reduce gastric discomfort. Citrus

compounds are also known to regulate gastrointestinal activity and provide anti-inflammatory effects that may help decrease nausea symptoms (Sun et al., 2025).

In addition, the inhalation of citrus lemon aromatherapy reduced PUQE-24 scores from moderate nausea and vomiting to no nausea and vomiting among first-trimester pregnant women. Lemon essential oils containing citral and linalool may influence olfactory pathways and help reduce the perception of nausea (Fadhila Destya Fatmawati et al., 2025). Honey may further support symptom reduction because it provides natural energy, antioxidants, and a soothing effect on the digestive system. The sweet taste of honey can also improve appetite and help pregnant women feel more comfortable during episodes of nausea and vomiting. Therefore, the combination of lime and honey may produce complementary effects in reducing emesis gravidarum during early pregnancy. Overall, these findings suggest that lime combined with honey can be considered a simple, affordable, and non-pharmacological complementary therapy for managing nausea and vomiting in first-trimester pregnant women, particularly in community midwifery and antenatal care services.

The findings of this study are consistent with previous study about same issues who reported that many pregnant women prefer herbal products as complementary therapies because they are considered more natural, affordable, and safer than pharmacological treatments. Herbal approaches are widely used to manage pregnancy discomforts, especially nausea and vomiting during the first trimester (Sökmen & Koç, 2025). Similarly, with the latest research emphasized that nutritional strategies and natural food-based therapies can effectively help reduce nausea and vomiting in pregnancy. Their review recommended the consumption of citrus fruits, foods rich in vitamin B6, adequate hydration, and small frequent meals to improve maternal comfort and reduce emesis symptoms (Rondanelli et al., 2025). The antiemetic effect of lime may be related to its bioactive compounds such as citric acid, flavonoids, limonene, and citral. These compounds may regulate gastrointestinal activity, improve digestion, and provide anti-inflammatory effects. Citrus-based aromatherapy significantly reduced physiological and psychological symptoms during pregnancy, including nausea and vomiting, through olfactory stimulation and relaxation effects (Mascarenhas et al., 2025). In addition, citrus plants are traditionally used in women's health care because they possess anti-inflammatory, gastrointestinal regulatory, and

antiemetic properties that may help relieve morning sickness during pregnancy (Brahmi et al., 2025).

The results of this study are also supported by the reasearch Wulandari, Purwati, and Widiatrilupi (2023), that found that honey lime juice effectively reduced nausea and vomiting in pregnant women with emesis gravidarum. Lime contains vitamin C and flavonoids that may improve gastric comfort, while honey provides antioxidants and natural energy that help maintain maternal stamina during pregnancy (Dewi Wulandari et al., 2025). Honey may also soothe the digestive tract and improve appetite, thereby reducing discomfort associated with nausea and vomiting. Honey has antioxidant, antimicrobial, anti-inflammatory, and nutritional benefits that may support maternal health during pregnancy (Anjani & Fuad, 2025). Furthermore, Hariati, Sembiring, and Harahap (2023) reported that natural drinks combined with honey significantly reduced nausea and vomiting among first-trimester pregnant women because they help maintain hydration, electrolyte balance, and energy intake (Citra Hariati et al., 2025). The combination of ginger decoction, lime juice, and honey effectively decreased nausea and vomiting during pregnancy. Ginger works by regulating gastrointestinal motility and antiemetic pathways, while lime and honey provide complementary soothing and antioxidant effects (Fazriah et al., 2025).

The Effect of Vitamin B6 on the Intensity of Nausea and Vomiting

In addition to herbal therapy, which can be an alternative treatment for hyperemesis gravidarum, vitamin B6 (pyridoxine) is often used as a conventional treatment for nausea and vomiting during pregnancy. In its basic mechanism, vitamin B6 plays a major role in coordinating the body's metabolic processes. Overall, it ensures the normal functioning of the nervous system, hormone regulation, tissue repair, cell growth, and the formation of red blood cells, nucleic acids, and amino acids that are also needed by the body (Khairani & Putri, 2022). The generally recommended dose is 10-25 mg 2-3 times a day. Vitamin B6 has been proven effective in reducing nausea and vomiting symptoms during pregnancy. It is the first choice often used (Herien, 2024). Similar to other studies stating that vitamin B6 is effective in reducing nausea and vomiting (P=0.001) (Khairani & Putri, 2022). This previous study supports the current research because the control group given B6 obtained a p-value of 0.002. In the case study, it was found that vitamin B6 can be

used to treat nausea, vomiting, and other symptoms commonly experienced by women during early pregnancy. Vitamin B6 is found in meat, liver, kidneys, eggs, and wheat, among other foods. In the liver, vitamin B6 is converted into its active form, pyridoxal-5-phosphate (P5P), with the help of the cofactors riboflavin and magnesium. This substance plays an important role as a coenzyme in protein and amino acid metabolism, including in the conversion of tryptophan via oxytryptan into serotonin, as well as in GABA synthesis. It also plays a minor role in carbohydrate and fat metabolism (Dewi et al., 2024).

After comparing the combination of lime and honey therapy with B6 therapy alone, the combination of lime and honey proved to be the most effective in treating nausea and vomiting. This is evident from the difference in the mean before and after treatment in each group, where the mean difference in the intervention group was smaller by 2.7 compared to the control group by 1.6. This indicates a significant difference in the mean between the intervention group and the control group (B6 therapy alone). This may occur because lime and honey naturally contain pyridoxine, similar to vitamin B6. Therefore, it is more effective in reducing the intensity of nausea and vomiting in pregnant women in the first trimester. After the trial was conducted, the results showed a decrease in nausea and vomiting scores in pregnant women. However, compared to other therapies, the effectiveness of lime and honey must be further studied in terms of dosage, administration method, and number of days of intervention.

In contrast to pharmacological therapy, complementary interventions using natural ingredients are considered relatively safer when consumed appropriately during pregnancy. The prolonged use of high doses of vitamin B6, although commonly recommended for emesis gravidarum, may potentially cause adverse neurological effects such as peripheral neuropathy. Therefore, the use of non-pharmacological therapies such as lime and honey may provide safer alternative options for pregnant women experiencing nausea and vomiting (He et al., 2025). Overall, the combination of lime and honey may serve as a simple, affordable, safe, and easily accessible complementary therapy for reducing the intensity of nausea and vomiting in first-trimester pregnant women. This intervention also has potential clinical implications for community midwifery practice and antenatal care services as supportive management for emesis gravidarum as the alternative to avoid the negative sides of pharmacological treatments.

CONCLUSION

Based on the results of research conducted on the Effectiveness of Lime (*Citrus Aurantifolia*) Combined with Honey on the Intensity of Nausea and Vomiting in Pregnant Women in the Working Area of the Guguk Panjang Community Health Center in Bukittinggi City, it can be concluded that the results of this study show an average decrease in the intensity of nausea and vomiting in the lime combined with honey group of and in the vitamin B6 group. The average reduction in both groups was statistically significant ($p < 0.05$). In conclusion, the average decrease in the lime and honey combination group was higher than that in the vitamin B6 group in terms of the intensity of nausea and vomiting in pregnant women in the first trimester.

SUGGESTION

Compared to other therapies, the effectiveness of lime and honey combination still needs to be further studied in relation to dosage, method of administration, and number of days of intervention. This study had several limitations, including a relatively small sample size, a short intervention duration, and the potential for subjective bias in the measurement of nausea and vomiting using the PUQE-24 questionnaire, which relied on participants' self-reported responses. Despite these limitations, the findings of this study provide important clinical implications for community midwifery services and antenatal care (ANC). The use of lime juice may serve as a simple, affordable, and non-pharmacological complementary intervention to help reduce nausea and vomiting during the first trimester of pregnancy. Therefore, this intervention has the potential to be applied in routine ANC services and community-based maternal health programs as supportive care for pregnant women experiencing emesis gravidarum.

REFERENCE

- Ani, I. P., & Machfudloh. (2021). Literature Review: Pengobatan Bagi Ibu Hamil Untuk Meredakan Mual Muntah. *JITK*, 12(2), 20–26. <http://ojs.stikesbhamadaslawi.ac.id/index.php/jik>
- Anjani, N. A. V., & Fuad, W. E. M. (2025). Review of the multifaceted health benefits of Malaysian honeys: Impacts on pregnancy. In *Indian Journal of Natural Products and Resources* (Vol. 16, Number 4, pp. 498–512). National Institute of Science Communication and

- Policy Research.
<https://doi.org/10.56042/ijnpr.v16i4.15999>
- Aziz, A., Wahyuni, D. R., & Khoiriah, R. (2024). Efektivitas Konsumsi Perasan Air Jeruk Nipis Hangat Dalam Mengurangi Emesis Gravidarum Pada Ibu Hamil Trimester 1 Di PMB I Tahun 2023. *Jurnal Ilmu Kebidanan Dan Kesehatan*, 15(1), 36–41.
- Brahmi, F., Kampemba Mujinga, F., Guendouze, N., Madani, K., Boulekbache, L., & Duez, P. (2025). Benefits of Traditional Medicinal Plants to African Women's Health: An Overview of the Literature. In *Diseases* (Vol. 13, Number 5). Multidisciplinary Digital Publishing Institute (MDPI).
<https://doi.org/10.3390/diseases13050160>
- Citra Hariati, M., Markus Sembiring, I., & Andini Harahap, F. (2025). Pengaruh konsumsi air kelapa muda (*Cocos nucifera* L.) dan madu terhadap penurunan mual dan muntah pada ibu hamil trimester I. *Tropical Public Health Journal*, 5(1), 52–60.
<https://doi.org/10.32734/trophico.v5i1.21280>
- Damayanti, M., & Jannah, R. (2022). Penyuluhan dan Pemanfaatan Jeruk Nipis Madu (JEMU) untuk Mengatasi Emesis Gravidarum. *Jurnal Pengabdian UntukMu NegeRI*, 6(2), 57–64.
<https://doi.org/10.37859/jpumri.v6i2.3336>
- Dewi, D. P., Yelda, F., & Jayatmi, I. (2024). Efektifitas Pemberian Vitamin B6 dan Jahe pada Ibu Hamil dengan Hyperemesis Gravidarum. *SIMFISIS: Jurnal Kebidanan Indonesia*, 4(1), 774–785.
<https://doi.org/10.53801/sjki.v4i1.222>
- Dewi Wulandari, Anik Purwati, & Maria Veronika Widiatrilupi. (2025). The Effect of Giving Honey Lime Juice (*Citrus Aurantifolia*) to Nausea Vomiting in Pregnant Women with Emesis Gravidarum. *Proceeding of The International Conference of Inovation, Science, Technology, Education, Children, and Health*, 5(1), 432–439.
<https://doi.org/10.62951/icistech.v5i1.207>
- Endry Sulistyowati, Sri Mintarsih, Sulastris Sulastris, & Hanantya Henry Setyabudi. (2023). Efek Pemberian Campuran Madu Terhadap Peningkatan Kadar Hemoglobin Pada Ibu Hamil Dengan Anemia. *OBAT: Jurnal Riset Ilmu Farmasi Dan Kesehatan*, 1(6), 171–182.
<https://doi.org/10.61132/obat.v1i6.806>
- Fadhila Destya Fatmawati, Priyatin Sulistyowati, & Dwi Astuti. (2025). The Effect Of Inhalation Of Citrus Lemon Aromatherapy On The Degree Of Nausea And Vomiting In Pregnant Women In Trimester I. *Multidisciplinary Indonesian Center Journal (MICJO)*, 2(3), 3026–3031.
<https://doi.org/10.62567/micjo.v2i3.734>
- Fazriah, T. N., Febriyani, P. A., Pendidikan, J., & Bidan, P. (2025). Efektivitas Pemberian Rebusan Jahe Dan Air Perasan Jeruk Nipis Madu Terhadap Mual Muntah Pada Ibu Hamil Trimester I Di Pmb R Di Pandeglang Tahun 2024. *Jurnal Riset Ilmiah*, 2(4), 1793–1803.
<https://doi.org/10.62335>
- He, L., Fan, Y., Hu, Y., Tian, C., Tian, Y., Zhang, J., Ren, Y., & Tan, J. (2025). The potential hazards of high doses of vitamin B6 in treating nausea and vomiting in pregnancy: A systematic review. *Int J Gynecol Obstet*, 169, 38–50.
<https://doi.org/10.1002/ijgo.16032>
- Herien, Y. (2024). Konsep Mual Muntah Dalam Kehamilan. *Eureka Media Aksara*.
- Hindratni, F., & Sari, S. I. P. (2022). Kecemasan dan Mual Muntah Trimester I Selama Pandemi Covid 19. *Penerbit Natika*.
- Junaidah, R. (2024). Pengaruh pemberian madu untuk pencegahan rawat. *JIMR : Journal Of International Multidisciplinary Research*, 3(02), 126–134.
<https://doi.org/10.62668/jimr.v3i02.1321>
- Khairani, & Putri, M. (2022). Efektivitas Pemberian Pisang Ambon (*Musa Paradisiaca*) Dengan Vitamin B6 Dalam Menurunkan Intensitas Mual Muntah Pada Ibu Hamil TM 1 Di Klinik Lina. *Jurnal Ilmiah Kebidanan Imelda*, 8(2), 61–65.
<http://jurnal.uimedan.ac.id/index.php/JURNALKEBIDANAN>
- Khairiah, A., Nisyawati, & Silalahi, M. (2017). Biodiversity of medicinal plants by Minangkabau ethnic in Guguak Sarai, West Sumatera, Indonesia. *AIP Conference Proceedings*, 1862.
<https://doi.org/10.1063/1.4991213>
- Lestari, A. D., Sadila, A. S., Nara, A. D., Ayu, A., Putri, F., Febriani, A. N., & Barokah, A. F. (2022). Akupresur Mengurangi Mual Muntah Dalam Kehamilan: Literature Review. *JMSWH Journal of Midwifery Science and Women's Health*, 3(1), 8–15.
<https://doi.org/10.36082/jmswh.v3i1.566>
- Lubis, A. Y. S., & Abilowo, A. (2023). Pemberian Air Perasan Jeruk Nipis Madu Dalam Mengatasi Emesis Gravidarum pada Ibu Hamil. *Ahmar Metastatis Health Journal*, 3(3), 161–166.

- <http://journal.ahmareduc.or.id/index.php/AMHJ>
- Madiuw, D., Tahapary, W., Pattipeluhu, L., & Tasijawa, F. A. (2021). Strategi Penanganan Mual Muntah Ibu Hamil Melalui Kombinasi Intervensi Non Farmakologi: Tinjauan Literatur. 3, 46–53.
- Mascarenhas, V. H. A., Caroci-Becker, A., Nick, J. M., Sahin, S., Drigo, R. T. da C., Riesco, M. L., & Lima, M. de O. P. (2025). Effectiveness of aromatherapy on physiological and psychological symptoms during pregnancy: a systematic review and meta-analysis. In *Complementary Therapies in Medicine* (Vol. 95). Elsevier Ltd. <https://doi.org/10.1016/j.ctim.2025.103279>
- Menteri Kesehatan RI. (2014). PMK Nomor 5 Tahun 2014.
- Munthe, J., Simbolon, M., Adithya, K., & Damanik, L. P. U. (2019). Buku Ajar Asuhan Kebidanan Berkesinambungan. Trans Info Media. www.transinfotim.blogspot.com
- Nurmasyithah, Ariyanti, R., & Permatasari, A. E. (2025). The Effectiveness of Ginger, Lemon, and Honey Decoction in Reducing Nausea and Vomiting in Pregnant Women with Emesis Gravidarum: A Quasi-Experimental Study. *Tropical Health and Medical Research*, 7(1), 25–31. <https://tropicalhealthandmedicalresearch.com>
- Pratiwi, L., Ambarsari, N., & Nuraeni, A. (2024). Pengaruh Konsumsi Air Serai (Cymbopogon Citratus), Jahe (Zingiber Officinale), Jeruk Nipis (Citrus Aurantiifolia) Dan Madu Hangat Dalam Mengatasi Hiperemesis Gravidarum Pada Ibu Hamil Trimester I. *JIKA*, 9(1), 2598–3857.
- Prihartini, N., Dewi Silangit, A., Studi, P. D., Institut Kesehatan Sumatera Utara Ji Jamin Ginting, K., & Cih Medan Tuntungan, L. (2026). The Relationship Between Giving Lime And Honey To Reduce Nausea And Vomiting In Pregnant Women In The First Trimester At The Sarfina Sembiring Clinic In 2025. *International Journal of Health, Economics, and Social Sciences (IJHESS)*, 8(2), 1667–1674. <https://doi.org/10.56338/ijhess.v8i2.10929>
- Rondanelli, M., Perna, S., Cattaneo, C., Gasparri, C., Barrile, G. C., Moroni, A., Minonne, L., Lazzarotti, A., Mansueto, F., & Mazzola, G. (2025). A Food Pyramid and Nutritional Strategies for Managing Nausea and Vomiting During Pregnancy: A Systematic Review. In *Foods* (Vol. 14, Number 3). Multidisciplinary Digital Publishing Institute (MDPI). <https://doi.org/10.3390/foods14030373>
- Soa, U. O. M., Amelia, R., & Octaviani, D. A. (2018). Perbandingan Efektivitas Pemberian Rebusan Jahe Merah Dan Daun Mint Dengan Jeruk Nipis Dan Madu Terhadap Mual Muntah Pada Ibu Hamil Trimester I Di Puskesmas Waepana, Ngada, Ntt. *Jurnal Kebidanan*, 8, 157–167.
- Sökmen, Y., & Koç, E. (2025). Herbalists' Approaches to the Use of Herbal Products During Pregnancy: A Qualitative Study. *Balikesir Health Sciences Journal*, 14(1), 48–56. <https://doi.org/10.53424/balikesirsd.1531892>
- Sun, X., Nie, F., Sun, J., Zhang, J., & Wang, Y. (2025). Medicinal Plants for Chemotherapy-Induced Nausea and Vomiting: A Systematic Review of Antiemetic, Chemosensitizing, and Immunomodulatory Mechanisms. In *Therapeutics and Clinical Risk Management* (Vol. 21, pp. 1187–1218). Dove Medical Press Ltd. <https://doi.org/10.2147/TCRM.S531645>
- Yulia Sari Lubis, A., Damayanti, M., & Abilowo, A. (2024). Pengaruh Pemberian Air Perasan Jeruk Nipis (Citrus aurantiifolia) Dalam Mengurangi Emesis Gravidarum pada Ibu Hamil Trimester I. *Citra Delima Scientific Journal of Citra Internasional Institute*, 8(1), 27–31. <https://doi.org/10.33862/citradelima>