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The Effectiveness of Ginger, Lemon, and Honey Decoction in Reducing Nausea and Vomiting in Pregnant Women with Emesis Gravidarum: A Quasi-Experimental Study

***Nurmasyithah, Ririn Ariyanti, Annisa Eka Permatasari**

Bachelor of Midwifery Program, Health Science Faculty, Universitas Borneo Tarakan, Indonesia. *Email: sitaumar765@gmail.com

Abstract: Nausea and vomiting during pregnancy, or emesis gravidarum, can occur at any time and may persist into the second or third trimester, causing dehydration or severe complications if unmanaged. Ginger, lemon, and honey create a drink rich in vitamins, minerals, and enzymes beneficial for reducing these symptoms. This study aimed to analyze the effect of consuming a ginger, lemon, and honey decoction on pregnant women with emesis gravidarum at the Malinau City Health Center. Conducted from May to June 2024, this quasi-experimental study involved 30 participants divided into two groups: 15 in the Education group and 15 in the intervention group. The intervention involved consuming fresh ginger boiled with 3 cc of lemon juice and 1 tablespoon of honey twice daily for four days. Nausea and vomiting were measured using The Rhodes Index Nausea, Vomiting, and Retching (INVR), a validated questionnaire. Results showed a significant reduction in INVR scores in the intervention group compared to the Education group ($p < 0.001$). After four days, the mean score in the intervention group was 8.60, 2.53 points lower than the Education group (11.13). These findings demonstrate that consuming ginger, lemon, and honey decoction for four days effectively reduces nausea and vomiting in pregnant women.
Keywords: Ginger; lemon; honey; nausea; vomiting.

INTRODUCTION

During the first trimester of pregnancy, nausea and vomiting, known as emesis gravidarum, are common occurrences for pregnant women. However, if these symptoms persist in large amounts every day, it can disrupt the balance of nutrition, electrolytes, overall health, and daily routines. Emesis gravidarum is a normal or frequent pregnancy symptom that typically occurs in the first trimester of pregnancy. Although nausea usually happens in the morning, it can also occur at any time of the night[1]. Typically, these symptoms appear six weeks after the last day of menstruation and last for approximately ten weeks. The incidence of Hyperemesis Gravidarum in Indonesia reaches 56.4% of total complaints during pregnancy[2].

Emesis gravidarum is the term used to describe nausea and vomiting in pregnant women, although it can occur at any time[3]. In some cases, this can persist until the second and third trimesters of pregnancy; however, this is rarely the case due to continuous nausea and vomiting that can lead to dehydration and even weight loss in pregnant women. If not handled properly and promptly, it can have a negative impact on both the

Corresponding Author: Nurmasyithah
Bachelor of Midwifery Program, Health Science Faculty, Universitas Borneo Tarakan, Indonesia.
Email: sitaumar765@gmail.com

pregnant woman and the fetus and may even result in their death. Common symptoms in pregnant women in the first trimester include emesis gravidarum, which is certainly concerning for most mothers and families as the mother becomes frequently unwell and her activities are disrupted, especially when these symptoms are accompanied by vomiting and nausea that regurgitates previously eaten food[4]. Sometimes, anti-nausea medication may not work effectively when a pregnant woman experiences continuous vomiting. One of the reported non-pharmacological therapies that can be quite effective is the use of herbal plants to reduce nausea and vomiting during pregnancy, such as ginger, peppermint, lemon, and honey. Lemon contains Flavonoids that increase bile production, acid, and digestive fluids. The Flavonoid content will neutralize acidic digestive fluids and eliminate toxins in the body[5].

Previous research conducted by (Ariyanti, 2023) has found that ginger-based cake can significantly reduce the level of emesis gravidarum ($p<0.001$), as ginger rhizome consists of 1-4% essential oil and oleoresin. The distinctive smell and taste of ginger are caused by the essential oil and non-volatile phenolic compounds that have spicy properties. Furthermore, the research findings indicate that 40% of women have used lemon as a way to relieve nausea and vomiting. In comparison, 26.5% of women have considered consuming lemon juice as an effective method to control vomiting symptoms[6]. Lemons contain limonene, vitamin C, and limonene, which can inhibit prostaglandin activity to control cyclooxygenase I and II and reduce pain, including nausea and vomiting[7]. The combination of lemon water honey intervention even has an anti-nausea effect, as honey will stimulate prostaglandin mechanisms to control cyclooxygenase I and II, thus reducing pain, including nausea and vomiting[8].

Honey contains several essential minerals for the body. It has pyridoxine content as a receptor antagonist. Honey can help maintain stamina and health during pregnancy and provide high nutritional intake for the growth of the fetus in the womb[8]. Honey also contains vitamin B6 or pyridoxine (0.024 mg) as an antagonist to receptors against nausea. The sweet, slightly bitter, and acidic taste of honey can also help alleviate symptoms of nausea by providing a fresh and tangy sensation in the mouth[9]. The combination of ginger, lemon, and honey creates a beverage rich in vitamins, minerals, and beneficial enzymes for reducing nausea and vomiting[8]. This drink, consisting of these three ingredients, also has a good nutritional content for the health of pregnant women and their fetuses[9].

Based on the preliminary study in the form of a document review conducted at the Malinau Kota Community Health Center in 2023, it was found that the number of pregnant women in the first trimester was 550 out of the target of 580, with 132 at high-risk and 116 as the target for the year 2023. Researchers also conducted interviews with 26 pregnant women in the first trimester at the Malinau Kota Community Health Center. They obtained information that pregnant women were consuming the pharmacological drug Mediamer or Metoclopramide to alleviate their emesis gravidarum. Therefore, no non-pharmacological interventions had been carried out prior to this study to analyze the effect of giving boiled water from ginger, lemon, and honey on pregnant women with emesis gravidarum at the Malinau City Health Center.

MATERIALS AND METHODS

The research design in this study is a quasi-experimental. The research was conducted in June 2024 in the working area of the Malinau Kota Health Center, North Kalimantan, Indonesia. The intervention involved a decoction of 1 gram of fresh sliced ginger heated to a temperature ranging from 80–100°C, mixed with 3 cc of lemon juice (1 teaspoon) and 1 tablespoon of honey in 150 ml of water, consumed twice daily for four days. Nausea and vomiting were measured using the INVR questionnaire (The Rhodes Index Nausea, Vomiting, and Retching). The study sample consisted of 30 respondents divided into two groups: 15 participants in the group given boiled ginger, lemon, and honey, and 15 in the Education group. The Education group received information about the benefits of ginger, lemon, and honey in reducing nausea and vomiting during pregnancy. The education covered the antiemetic properties of ginger (such as its ability to block serotonin receptors), the digestive benefits of lemon flavonoids (which neutralize acids and alleviate nausea), and the nutritional value of honey (which contains vitamin B6 to help reduce nausea). The educational session was delivered in a structured format by trained health workers. Bivariate analysis was conducted to observe the effects of the intervention using the Mann-Whitney test. Approval for this study was obtained from the Ethics Commission of the Health Science Faculty, Universitas Borneo Tarakan, No. 059/KEPK-FIKES UBT/VI/2024.

RESULTS AND DISCUSSION

The majority of respondents consuming ginger, lemon, and honey were aged 20–35 years (66.7%), and most were multigravida (86.7%). Similarly, in the Education group, 66.7% were aged 20–35 years, with 60% being multigravida (Table 1).

Table 1. Illustrates the Characteristics of the Respondents

No	Characteristics	Intervention	%	Education	%
1	Age				
	<20 years old	0	0	1	6,7
	20-35 years old	10	66,7	10	66,7
	>35 years old	5	33,3	4	26,7
	Total	15	100	15	100
	Mean	1,33		1,20	
2	**Gravida**				
	Primigravida	1	6,7	3	20
	Multigravida	13	86,7	9	60
	Grande-Multigravida	1	6,7	3	20
	Total	15	100	15	100

The distribution of nausea and vomiting scores among respondents after the intervention is evident in the Education group, where the average INVR score is 11.13 with a minimum value of 10 and a maximum of 14. On the other hand, in the Ginger, Lemon, and Honey group, the average INVR score is 8.60, with a minimum of 8 and a maximum of 10. These distribution results indicate that the Ginger, Lemon, and Honey group have significantly different scores and averages compared to the Education Group (Table 2).

The Mann-Whitney analysis indicates a significant difference in INVR scores after the study between the Education and Ginger, Lemon, and Honey Infusion groups, with a p-value < 0.001. The mean INVR score of the Ginger, Lemon, and Honey Infusion group is 2.53 points lower (11.13 compared to 8.60) than the Education group. These results demonstrate that the intervention of ginger, lemon, and honey infusion has an impact on reducing emesis gravidarum in pregnant women (Table 3).

Tabel 2. Distribution of Scores INVR After Intervention

INVR score	**Education (n=) 15**	**%**	**Intervention (n=) 15**	**%**
Light Emesis Gravidarum 1-8	0	0	10	66.7
Moderate emesis Gravidarum 9-16	14	93.3	5	33.3
Heavy Emesis Gravidarum 17-24	1	6.7	0	0
Mean	11.13		8.60	
Median	1.83		0.92	
Std.Deviasi	10-14		8-10	

Tabel 3. Analysis of Mann Whitney Test Scores INVR After Intervention

INVR Score Post-Intervention	Group	Mean	Std error	P value	95% Confident Interval	
					Upper limit	Under limit
	Education	11.13	13.00	< 0.001	1.67	3.39
	Intervention	8.60	8.00			
	Total	30				

This result aligns with Ariyanti's (2023) research, which demonstrated that ginger supplementation, in the form of ginger cookies, significantly reduces the severity of hyperemesis gravidarum ($p < 0.001$). While Ariyanti's study focused on ginger cookies[6], the current study highlights the additional benefits of combining ginger with lemon and honey, further enhancing its effectiveness in reducing emesis gravidarum.

The research carried out by Kurniawati Yeni (2023) revealed that boiled ginger water reduces vomiting and nausea in pregnant women during the first trimester[10]. Essential oils, zingiberene, zingiberol, bisabolene, curcumin, gingerol, landrene, vitamin A, and bitter resin found in ginger are believed to aid individuals experiencing vomiting and stomach pain[11]. Ginger also directly affects the digestive system and the absorption

of toxins and acids due to its ability to inhibit serotonin, a neurotransmitter that functions in the central nervous system, and enterochromaffin cells to produce HCG[12,13].

According to the theory, ginger's mechanism in inhibiting nausea and vomiting is due to its ability to block serotonin receptors and produce antiemetic effects on the gastrointestinal and central nervous systems[14]. Furthermore, galanolactone, another component contained in ginger, is a competitive antagonist on the 5-HT receptor that causes antiemetic effects. The effect of ginger on the central nervous system was demonstrated in an experiment with 3 groups of test animals receiving doses of 0.1 ml / 0.2 ml / 0.3 ml of gingerol, resulting in a reduction in the frequency of vomiting at the end of the experiment in each group to 20/17/7 times in 24 hours[15].

Lemons contain limonene, a compound that can halt the action of prostaglandins, regulate cyclooxygenase I and II, suppress prostaglandins, and alleviate pain, such as nausea and vomiting. If taken in standard doses found in food or medication, lemons will not pose a risk of toxicity[7,16]. Initial emesis therapy should be conservative, accompanied by dietary changes, emotional support, and alternative therapies such as herbal remedies. Traditional concoctions with a hint of lemon can be utilized[17].

The flavonoids found in forest honey are the result of phenolic compounds interacting with bacterial cells through adsorption processes involving hydrogen bonding[18]. At low levels, weakly bound phenolic protein complexes are formed and quickly undergo degradation[19]. At high levels, phenols enter the cell and cause protein precipitation and denaturation[9].

Phenol functions as a disinfectant in concentrations of 0.01% to 1%[20]. In their role as an antibacterial, flavonoids are a group of phenols that tend to inhibit the activity of microbial enzymes, thereby disrupting the metabolic process[21]. Flavonoids enhance bile production, which neutralizes acid and reduces nausea, thus decreasing and eliminating the frequency of emesis gravidarum[22]. Researchers assume that the decrease in nausea and vomiting scores is highly influenced by the administration of boiled water with ginger, lemon, and honey.

The results of this study are expected to serve as a source of information to improve and adjust habits or cultural practices that are inconsistent with the proper management of nausea and vomiting during early pregnancy. This is particularly relevant in the Kalimantan region, which has the potential to produce high-quality ginger but has not yet optimized its processing for health interventions.

This quasi-experimental study is subject to limitations, including potential influences from confounding variables or co-factors. Therefore, future research is recommended to adopt a randomized controlled trial (RCT) design with a longer intervention duration, a larger sample size, and a more rigorous analysis to strengthen the validity and generalizability of the findings.

CONCLUSION

After the intervention, it is observed that the Education group respondents have an average INVR score of 11.13 with a minimum value of 10 and a maximum of 14. In contrast, the Ginger, Lemon, and Honey Infusion group has an average INVR score of 8.60 with a minimum of 8 and a maximum of 10. Mann-Whitney analysis shows that the intervention of providing ginger, lemon, and honey infusion is effective in reducing nausea and vomiting in pregnant women, with a p-value < 0.001. These results indicate that the

Ginger, Lemon, and Honey Infusion group has significantly different scores and averages compared to the Education group. The average INVR score of the Ginger, Lemon, and Honey Infusion group is 2.53 points lower (11.13 compared to 8.60) than the Education group. These results imply that giving lemon, ginger, and honey directly is more effective in reducing nausea and vomiting than just explaining because people are sometimes lazy or do not have the raw materials to make it.

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CONFLICT OF INTEREST

There are no conflicts of interest in this study with any party.

REFERENCES

1. Nyoman Yeyen Abriyani N, Renasari Presty M, Kurniati A. Literatur Review Terapi Nonfarmakologis Untuk Mengurangi Mual Muntah Pada Ibu Hamil. Jurnal Kebidanan. 2020 Oct;10(2): 532–9.
2. Fauziah Na, Komalasari, Sari Dn. Faktor-Faktor Yang Mempengaruhi Emesis Gravidarum Pada Ibu Hamil Trimester 1. Majalah Kesehatan Indonesia. 2022;3(1).
3. Azizah N, Kundaryanti R, Novelia S. The Effect Of Ginger Decoction On Emesis Gravidarum Among Trimester I Pregnant Women. Nursing And Health Sciences Journal (Nhsj). 2022 Apr 1;2(2): 5–9.
4. Faridah Bd, Ponda A, Pertiwi Ht. Pengaruh Minuman Jahe Terhadap Penurunan Frekuensi Emesis Gravidarum Pada Ibu Hamil Trimester I Di Wilayah Puskesmas Lubuk Buaya Padang. Jurnal Ilmiah Kesehatan Ar Rum Salatiga. 2019;4(1): 23–32.
5. Fitri NL and Yuliaswati E. Pengaruh Pemberian Aromaterapi Lemon Untuk Mengatasi Frekuensi Emesis Gravidarum Untuk Ibu Hamil Trimester Pertama. Jurnal Inovasi Riset Ilmu Kesehatan. 2023;1(4).
6. Ariyanti R, Widyawati Mn, Nurasmi N, Mardhiana M, Yulianti I. The Effect Of Dayak Ginger (*Zingiber Officinale Roscoe*) Extraction In Ginger Cookies In Reducing Emesis Gravidarum Severity Among Pregnant Women. Healthc Low Resour Settings. 2023;11(2).
7. Wulandari Rcl, Sulistyowati R. Review Literatur Pengaruh Pemberian Aromaterapi Lemon Terhadap Emesis Gravidarum. Jurnal Midwifery Update (Mu). 2021;3(1).
8. Vidi Sri Chandra, Galaupa R. Comparison Of Giving A Combination Of Red Ginger And Mint Leaves Booked With A Combination Of Lime And Honey On The Intensity Of Voting In Pregnant Women In Trimester I. International Journal Of Health And Pharmaceutical (Ijhp). 2022;2(4).
9. Fitriwati Ci, Setyowati S, Budiati T. The Effect Of Consume Ginger And Honey Biscuits On The Frecuency Of Nausea And Vomiting In Teenage Pregnancy. Journal Of Maternity Care And Reproductive Health. 2020;2(4).
10. Kurniawati Y, Widowati R, Dahlan Fm. Efektivitas Jahe Dan Madu Akasia Terhadap Mual Dan Muntah Ibu Hamil Trimester I. Jurnal Kesehatan Poltekkes Kemenkes Ri Pangkalpinang. 2023;11(1).

11. Nikkhah Bodagh M, Maleki I, Hekmatdoost A. Ginger in gastrointestinal disorders: A systematic review of clinical trials. Food Sci Nutr. 2018 Nov 5;7(1): 96-108.
12. Efrina, Kasim A, Anggraini T, Novelina, Asben A. The Used Effect Of Yellow Ginger And Red Ginger On Physical Characteristic, Total Phenol, And The Content Of Gingerol, Shogaol Of Ginger Ting-Ting (*Zingiber Officinale*). Jurnal Litbang Industri. 2018;8(2): 61–6.
13. Supatmi, Setia Suhartikah F, Sumarliyah E. Pengaruh Pemberian Gingercookies Pada Nausea Dan Vomiting Wanita Hamil Trimester Pertama. Jurnal Keperawatan Muhammadiyah. 2017;2(1): 75–9.
14. Zhao YZ, Dai YZ, Nie K. Research Progress on the Antiemetic Effect of Traditional Chinese Medicine Against Chemotherapy-Induced Nausea and Vomiting: A Review. Front Pharmacol. 2022 Feb 9;12: 790784
15. Firdausni F, Kamsina K. Pengaruh Pemakaian Jahe Dan Jahe Merah Terhadap Karakteristik Fisik, Total Fenol Dan Kandungan Gingerol, Shogaol Ting Ting Jahe (*Zingiber Officinale*). Jurnal Litbang Industri. 2018;8(2).
16. Sarwinanti S, Istiqomah Na. Perbedaan Aromatherapi Lavender Dan Lemon Untuk Menurunkan Mual Muntah Ibu Hamil. Jurnal Kebidanan Dan Keperawatan Aisyiyah. 2020 Jan 17;15(2): 185–95.
17. Herty Aj, Setiowati Ot, Asiah, Haryanti S. Pengaruh Inhalasi Lemon Terhadap Mual Muntah Pada Ibu Hamil Trimester Pertama. Zona Kebidanan. 2021;11(3).
18. Miguel MG, Antunes MD, Faleiro ML. Honey as a Complementary Medicine. Integr Med Insights. 2017 Apr 24;12: 1178633717702869
19. Usman An, Raya I, Yasmin R, Aliyah, Dirpan A, Arsyad A. Ginger Honey Affects Cortisol, Estrogen And Glutathione Levels; Preliminary Study To Target Preconceptional Women. Gac Sanit. 2021 Jan 1;35: S251–3.
20. Meng L, Chen J, Kong D, Ji Y, Lu J, Yin X, Zhou Q. Transformation of bromide and formation of brominated disinfection byproducts in peracetic acid oxidation of phenol. Chemosphere. 2022 Mar;291(Pt 1): 132698.
21. Makarewicz M, Drożdż I, Tarko T, Duda-Chodak A. The Interactions Between Polyphenols And Microorganisms, Especially Gut Microbiota. Antioxidants. 2021;10(2).
22. Cheema Hs, Singh Mp. The Use Of Medicinal Plants In Digestive System Related Disorders- A Systematic Review. Journal Of Ayurvedic And Herbal Medicine. 2021 Sep 30;7(3): 182–7