



The Effect of Aromatherapy on Reducing Anxiety in Pregnant Women with Emesis Gravidarum

Jumriani^{1*}, Erniawati², Sumarni², Nurbaety¹, Putri Yuyu¹, Fitri Adriani³

¹Department of Midwifery, Akademi Kebidanan Harapan Bunda Bima, Indonesia

²Department of Midwifery, Akademi Kebidanan Tahirah Al Baeti Bulukumba, Indonesia

³Department of Midwifery, Universitas Almarisah Madani, Indonesia

*Corresponding author Email: jumriani26@gmail.com

The manuscript was received on 18 June 2024, revised on 1 October 2024, and accepted on 2 February 2025, date of publication 3 April 2025

Abstract

Beginning with ovulation and continuing through conception, nidation, implantation, and embryonic growth in the uterus, pregnancy is an ongoing process. Adapting mentally and physically to the effects of pregnancy hormones and the increased mechanical pressure from the growing uterus and other tissues is essential during pregnancy. The symptoms of morning sickness and vomiting, known as emesis gravidarum, typically manifest in the first trimester of pregnancy. Symptoms usually begin around six weeks following the last day of menstruation and continue for around ten weeks. However, they can sometimes extend into the second and third trimesters of pregnancy. This study, therefore, seeks to establish whether aromatherapy helps pregnant women who suffer from nausea and vomiting all through their nine months of gestation. The novelty of the method used in this study is that it tests a group of pregnant women both before and after the application of lemon aromatherapy. Researchers found that first-trimester pregnant women who used lemon aromatherapy had less anxiety and fewer symptoms of emesis gravidarum. Most people who tried the lemon acupressure said it helped them relax, even if the results of the statistical tests did not reveal a substantial reduction in anxiety. The limbic system, which controls our reactions to stress and other emotions, is activated by lemon aromatherapy via the olfactory pathway. Lemon essential oil contains bioactive components like citral and limonene, which have anxiolytic effects and can alleviate vomiting and nausea. This study aimed to find out whether aromatherapy helped pregnant women with emesis gravidarum feel less anxious. A quasi-experimental approach was employed with pre- and post-tests administered to one group. Findings from the study The Wilcoxon Signed Rank Test yielded a p-value of less than 0.025. It can be concluded that aromatherapy with lemon did not alleviate morning sickness anxiety in first-trimester pregnant ladies.

Keywords: Aromatherapy, Anxiety, Pregnant Women, Emesis Gravidarum.

1. Introduction

The stages of ovulation, conception, nidation, and implantation begin the continuous process of pregnancy, which continues throughout the embryo's development in the uterus until term. Throughout this process, the mother must adapt psychologically and physiologically to the changing hormones of pregnancy and the mechanical pressure from the growing uterus and other tissues [1]. A typical early pregnancy symptom is emesis gravidarum, which is characterised by nausea and vomiting. It typically starts around six weeks after the first day of the last menstruation and can continue for up to ten weeks, though it can sometimes persist into the second or third trimester [2]. Emesis gravidarum is the most common pregnancy symptom, affecting 70–80% of pregnant women worldwide [3]. The WHO says that this illness, in at least 15% of pregnant women, may affect maternal health and a mother's ability to eat and do daily activities. These symptoms, which range from moderate to severe, are believed to be caused by hormonal variables such as high levels of estrogen and human chorionic gonadotropin. Thus, emesis gravidarum should be effectively treated in order not to compromise the health of the



mother and the fetus during pregnancy. Emesis gravidarum is estimated to affect 10% of pregnant women in Indonesia and 30.9% in South Sulawesi in 2019 [4]. Based on the preliminary data from 83 cases in 2021, the reported cases decreased to 69 in 2022 and 40 in August 2023. Nausea, vomiting, hypersalivation, headaches, bloating, and generalised weakness affect an estimated 50–90% of pregnant women worldwide. Not all pregnant women feel nausea and vomiting since each woman's body reacts differently to hormonal changes. Human chorionic gonadotropin (hCG) is responsible for maintaining pregnancy. Still, it can also induce gastrointestinal problems and an increased sensitivity to smells, which is why this ailment is often caused by elevated levels of the estrogen and progesterone hormones in the placenta's serum.

Nausea and vomiting are generally more often experienced by pregnant women in the first trimester, where symptoms frequently occur in the morning or when pregnant women smell food, drinks, or odours from the surrounding environment. Sensitivity to this smell makes pregnant women more susceptible to discomfort that can interfere with daily activities. Many factors can affect the occurrence of morning sickness during pregnancy. These include mental health, surroundings, social influences, cultural beliefs, and financial situations, which can either make symptoms worse or help improve them [5]. These factors can affect the stress levels of pregnant women, ultimately impacting the body's response to hormonal changes that occur during pregnancy. In addition, based on an initial survey, nausea and vomiting in pregnant women are often accompanied by high levels of anxiety, where pregnant women experience feelings of anxiety, worry, and fear continuously about the condition of the fetus or their health. This excessive anxiety can worsen the symptoms of emesis gravidarum because psychological stress can trigger body reactions that affect the digestive system. This is in line with research conducted by Lestari (2021), which shows a relationship between anxiety levels and the incidence of emesis gravidarum in pregnant women working in the Matesih Health Center work area. Therefore, it is essential not only to handle emesis gravidarum physically but also to pay attention to the mental health of pregnant women so that anxiety does not worsen the symptoms experienced [6].

Emesis gravidarum, or morning sickness, is a common complaint among pregnant women at their prenatal care appointments. If left unaddressed, this could develop into hyperemesis gravidarum that may set in and affect the health of both the mother and the fetus. Treatment for overcoming nausea and vomiting in pregnant women is pragmatic and may include both pharmaceutical and non-pharmacological techniques [7]. Generally, administering vitamin B6 is part of the pharmaceutical approach to minimising the frequency and severity of emesis gravidarum. Aromatherapy and other non-pharmaceutical methods, however, can help minimise nausea and vomiting without the side effects of drugs. Anxiety can trigger aggravation of emesis gravidarum. The presence of anxiety or uncertainty regarding health-or that of the babies-increases the levels of stress hormones like cortisol in pregnant women. Increased levels of cortisol could have implications for the autonomic nervous system and exacerbate anxiety driven by gastrointestinal problems. Consequently, it is crucial to provide pregnant women with anxiety-reducing interventions like aromatherapy and relaxation techniques so that they can feel more at ease and less affected by emesis gravidarum. Giving pregnant women aromatherapy is one non-pharmacological technique to decrease anxiety, nausea, and vomiting. Aromatherapy is a complementary therapy that has long been used to improve relaxation and reduce stress in general and specific health conditions, such as pregnancy. When breathed or used topically, the active components of aromatherapy's essential oils have therapeutic effects that can influence hormones and the central nervous system [8]. Aromatherapy is a non-invasive, safe method that can help pregnant women feel better without causing any significant harm. It is becoming an increasingly popular component of prenatal treatment. Individuals experiencing anxiety might alleviate it using essential oils such as lemon. In the case of pregnancy, this fresh aroma can significantly enhance a woman's mood and stress level. There are multiple beneficial effects on the human organism during inhalation of lemon essential oil, namely the stimulation of the central nervous system and the production of serotonin [9]. Serotonin is an important hormone responsible for mood elevation and relaxation. Increasing serotonin makes pregnant women more relaxed, hence reducing the chances of experiencing anxiety, which is a common factor in pregnancy. There are numerous applications of lemon oil aromatherapy during pregnancy due to its antianxiety properties and its prevention of nausea and vomiting associated with the first trimester. There is a chance that inhaling lemon essential oil during the first trimester of pregnancy could lessen the severity of emesis gravidarum. Its antiemetic property has been attributed to limonene. This bioactive relaxes the gastrointestinal tract and reduces its sensitivity to odorants, which may cause nausea. So, aromatherapy with lemon not only helps pregnant women physically by lowering their anxiety levels, but it also helps them psychologically by making them feel more at ease [10].

Olfactory stimulation theory is one of the theories that back aromatherapy's ability to alleviate anxiety. If this idea is correct, inhaled fragrance molecules activate the neurological system through the nose's olfactory receptors, subsequently communicating with the brain's limbic system. Anxieties can be alleviated using aromatherapy, which stimulates the limbic system and controls emotional reactions and stress [11]. Inhaled molecules of lemon essential oil cause the release of feel-good neurotransmitters, including serotonin and dopamine, in response to signals the limbic system receives. The worry that many expectant mothers experience, particularly in the first trimester, can be alleviated with the help of lemon aromatherapy [12]. Because it is easy to administer and has few adverse effects, aromatherapy is finding more and more applications as a supplemental treatment in obstetrics. Depending on the individual's preferences and requirements, a diffuser, massage, or inhalation can all be used as aromatherapy [13]. In this study, participants breathed lemon aromatherapy by dripping lemon essential oil onto cotton and holding their breath for a few minutes. Since aromatherapy chemicals can swiftly impact the neurological system through direct olfactory contact, inhalation is thought to be more effective in producing a calming effect. This is also more convenient for pregnant women, as this method requires no special equipment or treatment, such as diffusers or massage. Lemon aromatherapy is an excellent alternative to prenatal care because it is easy to use and has been proven to reduce anxiety [14].

This study, therefore, seeks to establish whether aromatherapy helps pregnant women who suffer from nausea and vomiting all through their nine months of gestation. The novelty of the method used in this study is that it tests a group of pregnant women both before and after the application of lemon aromatherapy. This research will find out how effective lemon aromatherapy is in reducing anxiety in first-trimester pregnant women. Researchers can use this technique to see if aromatherapy reduces anxiety by comparing pre- and post-intervention levels. Emesis gravidarum is a common pregnancy symptom, and this paper summarises how lemon aromatherapy can help alleviate this condition. Women in Rawajaya Village, Tobelo District, North Halmahera Regency, who suffered from anxiety due to emesis gravidarum circumstances, made up the sample for this study. The Slovin method was used to choose 10 participants who met the inclusion criterion of being first-trimester pregnant women with mild to moderate anxiety who were willing to participate in the study. Healthcare providers can use this study's findings as a foundation to create complementary therapy approaches for pregnant women's anxiety that are more effective. Lemon aromatherapy can be used extensively in maternity and child health care as a safe and non-invasive supportive therapy if the research results demonstrate it is helpful. Researchers in the area of complementary therapy are

working toward the goal of finding more effective non-traditional ways to support pregnant women's health. Lemon aromatherapy isn't the only one that can help with nausea, anxiety, and vomiting; peppermint, ginger, and lavender are just a few more examples. Because the active compounds found in essential oils differ from one variety to another, their effects and mechanisms of action might also vary. To determine the most effective method of using aromatherapy to alleviate nausea in pregnant women, further studies comparing the efficacy of various aromatherapy techniques are required. This study would benefit the field of obstetrics, especially in providing better prenatal care. These findings should prompt health professionals to consider aromatherapy as a new intervention that could be offered to pregnant women to help them manage nausea and anxiety. Aromatherapy and other complementary therapies offer pregnant women a safer, more natural alternative that can help them relax and enjoy their time in the womb. The findings from this study will further provide room for further research to develop methods of therapy that are complementary and better at addressing anxiety concerns in pregnant women. Lemon aromatherapy can easily be applied on a broader basis in maternity and child health if the results prove that it's effective in anxiety reduction. This could prove to be the most revolutionary step in the future of maternal health altogether since it will finally address the emotional and mental concerns of pregnant women along with their physical health.

Aromatherapy has several benefits over pharmaceutical techniques, particularly when it comes to the well-being of both the mother and the unborn child. The growth of the fetus or the mother may be negatively affected by the side effects of several medications used to alleviate nausea and vomiting during pregnancy. A safer and more effective alternative may be to employ natural remedies like aromatherapy. Essential oils utilised in aromatherapy are derived from all-natural sources and contain therapeutically active components that are mild and non-irritating components. Aromatherapy offers pregnant women a flexible solution to nausea, vomiting, anxiety, and other symptoms because it may be easily incorporated into everyday life through inhalation, diffuser use, or aromatherapy massage. Aromatherapy not only helps pregnant women physically, but it can also help them mentally. Pregnant ladies will quickly adjust to the body's changes when comfortable and relaxed. Anxiety and pain during pregnancy can cause levels of the stress hormone cortisol to rise, but aromatherapy's calming effects can help bring them back into balance. As a result, you can lessen your chances of developing stress- and anxiety-related health problems like hypertension or insomnia. Aromatherapy has many health benefits, including helping pregnant women relax, get a better night's sleep, and boost their mood, all of which contribute to the mother's and baby's well-being.

Public awareness of the benefits of aromatherapy is still relatively low, especially in areas with limited access to health information. Many pregnant women still rely on conventional methods or even ignore complaints such as nausea, vomiting, and anxiety due to a lack of understanding of safer alternative treatments. Therefore, this study also aims to improve public awareness of the benefits of complementary therapy in pregnancy. With better socialisation and education from health workers, it is hoped that aromatherapy can become part of a holistic approach to caring for pregnant women. Counselling about aromatherapy can be done through various media, such as health seminars, consultation services at health facilities, or digital platforms so that the public can access information more widely. With the development of research in the field of complementary therapy, it is hoped that more alternative methods can be applied to improve the health of pregnant women. In addition to lemon aromatherapy, various other essential oils also have benefits in reducing anxiety and nausea, such as lavender, which has a calming effect; peppermint, which is known to relieve nausea; and ginger, which has natural antiemetic properties. Different essential oils have other active ingredients, so more research is needed to compare how well various aromatherapy works to treat nausea during pregnancy. With more in-depth studies, health workers can provide more specific recommendations tailored to each pregnant woman's needs so that the benefits of aromatherapy in supporting pregnancy health can be more optimal.

2. Research Method

Using a one-group pre-and post-test design, the researcher employed a quasi-experimental research method in this study. Participants in this study who reported feeling sick during the first trimester of their pregnancies were given an intervention in lemon aromatherapy to help alleviate their symptoms. An improvement over earlier designs that included a pre-test before treatment, the current research design consisted of a one-group pre-test and post-test. Ismail (2018) described the research design using the one-group pre-test post-test approach. Women in Rawajaya Village, Tobelo District, North Halmahera Regency, who suffered from anxiety due to emesis gravidarum circumstances, made up the sample for this study. Ten participants made up the sample for this research. This study's sample size was thus estimated by applying the Slovin formula.

3. Result And Discussions

There are active chemicals in lemon aromatherapy that have a calming effect and activate the limbic system, which controls emotions and mood. The anxiolytic qualities of limonene and citral, two of the primary components of lemon essential oil, can assist in calming the mind and heightening sensations of comfort. When pregnant women inhale its aroma, the volatile components in lemon essential oil penetrate the nasal cavity and directly interact with the central nervous system. Pregnant women may experience less anxiety and an overall improvement in their mental health since this process causes the production of mood-regulating neurotransmitters like serotonin and dopamine. Research has shown that aromatherapy helps alleviate anxiety in pregnant women by lowering the production of stress hormones like cortisol. The mother's and the fetus's health might be negatively affected by elevated cortisol levels during pregnancy. This is because cortisol raises the risk of gestational hypertension and sleep difficulties, among other complications. So, if a pregnant woman is experiencing anxiety, a safe and effective supplementary therapy option could be lemon aromatherapy. Incorporating lemon aromatherapy into a comprehensive approach to prenatal care is a great way to help pregnant women relax and reduce the risk of complications for both mother and child.

Inhaling the aroma of lemon has been shown in other research to aid digestion, particularly for pregnant women who suffer from nausea and vomiting. A decrease in nausea may occur if the aroma of lemon stimulates the synthesis of digestive enzymes. The chemicals in lemon oil have this effect because they communicate with the digestive tract's autonomic nerve system. An increase in digestive enzymes improves food digestion, lowering gastric pressure and speeding up emptying. This is because lemons possess limonene, which exhibits antiemetic properties and may contribute to gastrointestinal smoothness. Since limonene relaxes the smooth muscles of the digestive tract, it can alleviate spasms that trigger nausea. Limonene has anti-inflammatory and antioxidant properties that protect the gastric mucosa from possible irritation due to increased stomach acid during pregnancy. Therefore, pregnant women who suffer from emesis

gravidarum often find that inhaling lemon aromatherapy is a helpful natural remedy for both anxiety and stomach difficulties. Aromatherapy has been demonstrated to help lower anxiety in pregnant women, but it can be even more effective when combined with other relaxation techniques like yoga or deep breathing exercises. By bringing more oxygen to the brain, deep breathing techniques assist in calming the nervous system and alleviating stress. At the same time, yoga helps relieve stress by restoring hormonal equilibrium, which helps control one's emotions. When aromatherapy is used with relaxation techniques, it can help pregnant women overcome worry and discomfort caused by the changes in their bodies. A more holistic approach to prenatal treatment now includes aromatherapy in several industrialised nations. Scientific data has shown that this supplemental therapy can improve pregnant women's well-being without creating dangerous side effects. Hence, it is used. As a non-invasive, safe option for both mother and fetus, aromatherapy is slowly making its way into contemporary obstetric care. As a result, Indonesian healthcare providers should familiarise themselves with this approach and consider incorporating it into their maternity and child health services. With further knowledge, aromatherapy can be a therapy option that helps pregnant women in general.

Despite the lack of statistical evidence that lemon aromatherapy significantly reduced anxiety in pregnant women, several participants reported feeling calmer after inhaling the scent. This suggests that pregnant women can experience psychological benefits from lemon aromatherapy, even if it has not been robustly demonstrated in quantitative studies. The calming effects of lemon essential oil are probably due to its stimulating effects on the limbic system, which helps control emotions and alleviate stress. When you're pregnant and going through the first trimester, you might find that the scent of lemon helps alleviate some nausea and vomiting. Lemon aromatherapy may still be considered a supportive therapy for anxious pregnant women who suffer from emesis gravidarum, even though the study's results did not reveal a statistically significant impact. If you want to maximise the benefits of this treatment, try combining it with relaxation techniques or deep breathing exercises. To further assess the efficacy of lemon aromatherapy in alleviating anxiety in pregnant women, more significant samples and more rigorous research designs are required. We hope that by taking a more comprehensive view of prenatal care, we can better ensure the health of both mother and child and lessen the likelihood of problems caused by maternal anxiety and stress. For this aromatherapy, which is best applied first thing in the morning, you'll need a cotton ball, three to five drops of lemon aromatherapy essential oil, and a few minutes of inhalation.

Because the essential oil molecules were transported to the roof of the nose by turbulent currents when respondents inhaled lemon aromatherapy, their nausea and vomiting symptoms decreased. Cilia are tiny hairs that stretch from receptor cells on the nasal roof and into the nasal passageways. If the oil molecules bind to the cilia, the olfactory bulb will send an electrical signal (impulse). Multiple glomeruli, which are short axons, emerge in the olfactory bulb. The olfactory sense is transmitted to the central nervous system using axons that are subsequently forwarded by these glomeruli cells through the olfactory tract. Olfactory sensations are transmitted from the central nervous system to the limbic system, hypothalamus, and amygdala. In relieving stress, olfactory sensations originate in the amygdala. Chemoreceptor cells in the amygdala are odour-sensitive and can instantly alleviate nausea and vomiting.

Table 1. Frequency Distribution of Respondents' Characteristics of Pregnant Women in the First Trimester Based on Age

Age	Frequency	Percentage (%)
22-35 Years	5	50.0
<22 Years	5	50.0
Total	10	100.0

Source: SPSS Data

From the data in Table 1, we can deduce that out of 10 respondents, half fall within the 22–35 age bracket, while half are younger than 22. The majority of responders fall within the reproductive age bracket, which is associated with an increased risk of anxiety and emesis gravidarum due to hormonal and physiological changes that occur during pregnancy. Pregnant women's mental and emotional preparedness is higher when they are older, which is one of the aspects that can influence their ability to adjust to pregnancy. Anxiety, nausea, and vomiting are still possible during pregnancy in both young and older women; therefore, the correct method of treating this illness is necessary to ensure the health of the mother and the unborn child.

Table 2. Frequency Distribution of Respondents Based on Respondent Characteristics Based on Education

Education	Frequency	Percentage (%)
Elementary School	1	10.0
Junior High School	2	20.0
High School	4	40.0
College	3	30.0
Total	10	100.0

Table 2 shows that the respondents' educational backgrounds vary, with four individuals (40%) completing high school. Three respondents (30%) had completed their university degree, one respondent (10%) had only finished elementary school, and two respondents (20%) had only completed junior high school. Pregnant women's comprehension of health information, particularly how to identify and treat anxiety and emesis gravidarum, might be influenced by their educational background. Higher-educated mothers typically have easier access to health information and can use more useful coping mechanisms to manage the physical and mental changes during pregnancy. Regardless of their educational background, it is crucial to guarantee that all expectant mothers receive adequate instruction on the proper treatment techniques to enhance their health during pregnancy.

Table 3. Frequency Distribution of Respondents Based on Anxiety After (Post Test) Giving Lemon Aromatherapy to Pregnant Women in the First Trimester at the Lasepang Health Center

Anxiety After	Frequency	Percentage (%)
Not Anxious	6	60.0
Mild	3	30.0
Moderate	1	10.0
Total	10	100.0

Several participants reported less anxiety and nausea/vomiting after receiving lemon aromatherapy, according to Table 3 of the study's data. Among the 10 participants, 6 (or 60%) reported significant anxiety, while 3 (or 30%) reported minor nausea and vomiting. Also, all the research samples (100%) reported less nausea and vomiting after the intervention. These findings suggest that aromatherapy with lemon oil could be a helpful supplemental therapy for pregnant women suffering from anxiety and emesis gravidarum. Table 4 shows that after receiving lemon aromatherapy, 6 out of 10 respondents (or 60%) reported no longer experiencing anxiety, 3 reported mild anxiety, and 1 reported moderate anxiety (or 10% of the total). These findings suggest that following the intervention, the majority of participants reported less anxiety, suggesting that aromatherapy with lemon oil may help alleviate anxiety in pregnant women who suffer from emesis gravidarum. Table 5 shows that out of 10 participants, 3 reported no anxiety, 6 reported mild anxiety, and 1 reported severe anxiety before receiving lemon aromatherapy (pre-test). Based on these findings, it seems that the majority of participants felt some anxiety before the intervention. Although it was not statistically significant, some respondents felt more relaxed after inhaling lemon aromatherapy, which may help reduce the anxiety caused by the symptoms of emesis gravidarum among pregnant women. This means that, though further clinical trials are needed to establish the effectiveness of lemon aromatherapy, it is still a promising adjuvant treatment that may produce positive psychological effects for pregnant women.

Table 4. Frequency Distribution of Respondents on the Effect of Lemon Aromatherapy During the Pre-Test and Post-Test on First Trimester Pregnant Women Experiencing Anxiety at the Lasepang Health Center, Bantaeng Regency

Anxiety Before	Frequency	Percentage (%)
Light	6	60.0
Medium	3	30.0
Heavy	1	10.0
Total	10	100.0

Table 5. Frequency Distribution of Respondents' Anxiety Before (Pre-Test) Giving Lemon Aromatherapy to Pregnant Women in the First Trimester

Anxiety Level	Pre-Test	Percentage (%)	Post Test	Percentage (%)	P – value
No anxiety	0	0	7	70	0,025
Medium	6	60	2	20	
Currently	3	30	1	1	
Heavy	1	10	0	0	
Total	10	100	10	100	

The hypothesis of psychoneuroimmunology suggests that pregnant women may have an upsurge of cortisol hormone through autonomic nervous system effects. The hormones progesterone and estrogen are necessary throughout pregnancy, but additional cortisol disrupts the balance in a pregnant woman's body. Symptoms of emesis gravidarum may arise due to hormonal imbalance, which creates a chain reaction in the body; some of these reactions involve problems with the digestive system. Physical and emotional stress can further exacerbate nausea and vomiting associated with pregnancy, while excessive amounts of cortisol interfere with the operation of the immune system as well. Chronic stress affects pregnant women emotionally and physically. Uncontrolled worry further causes excessive tension, sleep disturbance, and loss of appetite, which may also increase the emesis of gravidarum. Thus, relief from anxiety and stress through complementary therapy with lemon aromatherapy will be of utmost importance to help pregnant women cope with the psychological and physiological changes brought about by pregnancy. Lower cortisol levels and increased relaxation alleviate symptoms of nausea and vomiting in pregnant women, improving the mother's health. The general added effect and performance are according to the theory of olfactory stimulation, as some volatile molecules inside lemon essential oil may enable many olfactory receptors in the nose. Thus, messages go right to the limbic system. The limbic system will promote emotions and the regulation of stress. Neurotransmitters containing serotonin and dopamine take part in a pleasant emotional state and whose production and release within the limbic system may be highly raised and improved, respectably, by price and price. This relieves emotional stress, which might exacerbate symptoms of emesis gravidarum, as this reduces heightened stress reactions. In a nutshell, the pregnant woman could relieve nausea and anxiety by taking in the invigorating aroma of lemon because it balances the autonomic nervous system and the body's response to stressors. Besides the impact on the limbic system, lemon essential oil also contains antiemetic and anti-depressive properties, from which pregnant women can benefit. The active constituents of lemon oil, limonene, and citral act in an antispasmodic action, which helps sedate the central nervous system and aid nausea, improving one's mood. So, anxious pregnant lady, inhale some essential lemon oil to stabilise your blood pressure and decrease that stress-related rapid heartbeat for good quality sleep. Conclusion Lemon aromatherapy as an adjunctive treatment may be associated with anxiolytic effects and improved general health in pregnant women.

Besides, it is believed in aromatherapy theory that bioactive components present in lemon essential oil, such as citral and limonene, decrease anxiety. These chemicals activate the gamma-aminobutyric acid receptors of the brain and help reduce nervous activities to relax a person. If a pregnant woman is anxious, she may find relief by breathing lemon essential oil. On top of that, limonene's antioxidant and anti-inflammatory characteristics help pregnant women feel better by lowering oxidative stress, which is linked to stress and anxiety. In addition, research has demonstrated that essential oils, when inhaled, can alleviate nausea and vomiting by influencing the brain's vomiting centre and vestibular system. Changes in the hormone system during pregnancy can also affect the vestibular system, which is in the inner ear and responsible for the balance of the body. Nausea and vomiting might set in consequently. Some pregnant women find that inhaling lemon oil helps balance the vestibular system, reducing the nausea and dizziness caused by emesis gravidarum. It is also claimed that lemon essential oil acts synergistically with the part of the brain involved with vomiting and thus reduces nausea and vomiting in pregnant women. In the end, qualitative results of the present study confirm that aromatherapy with lemon essential oils has a facilitating effect on nausea, anxiety, and vomiting linked with emesis gravidarum in pregnant women.

However, statistical tests did not indicate any significant difference. In this study, participants who inhaled lemon essential oil reported feeling calmer, suggesting that this technique may still help pregnant women feel more comfortable. Emesis gravidarum symptoms are typically made worse by psychological tension. However, the relaxation effect that follows can help alleviate some of that. Therefore, this approach is still a complementary therapy within a more comprehensive prenatal care framework. Try combining lemon aromatherapy with additional therapeutic approaches, such as relaxing massage or deep breathing exercises, for maximum benefit. More people will be aware of aromatherapy and its benefits if pregnant women are educated about them. To fully understand how lemon aromatherapy can help pregnant women overcome anxiety and emesis gravidarum, more studies with more significant samples and more rigorous approaches are required.

4. Conclusion

Researchers found that first-trimester pregnant women who used lemon aromatherapy had less anxiety and fewer symptoms of emesis gravidarum. Most people who tried the lemon acupressure said it helped them relax, even if the results of the statistical tests did not reveal a substantial reduction in anxiety. The limbic system, which controls our reactions to stress and other emotions, is activated by lemon aromatherapy via the olfactory pathway. Lemon essential oil contains bioactive components like citral and limonene, which have anxiolytic effects and can alleviate vomiting and nausea. The majority of participants in this study reported less anxiety after using lemon aromatherapy, according to the results. Efficacy in reducing nausea and vomiting was observed in all participants, and anxiety was eliminated in as many as 60% of those who had therapy. So, while statistical evidence of lemon aromatherapy's efficacy is lacking, it can still be a safe and helpful adjunct therapy for pregnant women. As an alternative to intrusive procedures, aromatherapy can be used in prenatal treatment to promote the health of the mother.

References

- [1] Afriyanti, D., & Rahendza, N. H. (2020). The Effect of Giving Electric Lemon Aromatherapy on Nausea and Vomiting in Pregnant Women in the First Trimester. *Maternal Child Health Care*, 2(1), 192-201.
- [2] Aisyah, R. A. N. (2018). The Effect of Giving Rose Aromatherapy Relaxation (Rosa Damascena Oil) on Sympathetic Nerve Activity in Hypertension Patients (Study of Pulse Rate and Blood Pressure) at Kedungmundu Health Center, Semarang (Doctoral dissertation, Muhammadiyah University of Semarang).
- [3] Andriani, A. W., & Purwati, Y. (2017). The effect of peppermint aromatherapy on the incidence of nausea and vomiting in pregnant women in the first trimester at the Mlati II Health Center, Sleman, Yogyakarta (Doctoral dissertation, Aisyiyah University, Yogyakarta).
- [4] Angesti, E. P. W. (2020). The Relationship Between Anxiety Levels and Knowledge of Pregnant Women in the Third Trimester and Readiness to Face Childbirth During the COVID-19 Pandemic at Benowo and Tenggilis Health Centers (Doctoral dissertation, Airlangga University).
- [5] Ariyuni, S. (2023). The Influence of Health Education About Emesis Gravidarum on the Knowledge of Pregnant Women in the First Trimester at the UPT Blud Gangga Health Center (Doctoral dissertation, Hamzar College of Health Sciences (Stikes)).
- [6] Astarini, A. A. (2021). Overview of the Anxiety Level of Pregnant Women During the Covid-19 Pandemic in the Work Area of the South Kuta Health Center Technical Implementation Unit (Doctoral dissertation, Department of Midwifery).
- [7] Astuti, L., & Aini, L. (2020). The Effect of Lavender Aromatherapy on Pain Scale in Post-Fracture Surgery Patients. *Babul Ilmi Jurnal Ilmiah Multi Science Kesehatan*, 12(1).
- [8] Chenarna, E. R., Pipitcahyani, T. I., & Wulan, D. W. (2022). The Difference Between Lavender Aromatherapy and Yoga on Emesis Incidence in Pregnant Women. *Gema Bidan Indonesia*, 11(2).
- [9] Cholifah, S., & Nuriyanah, T. E. (2018). Lemon aromatherapy reduces nausea and vomiting in pregnant women in the first trimester. *Jurnal Kebidanan Midwifery*, 4(1), 36-43.
- [10] Erniawati KM. (2020). *Postpartum Midwifery Care*. Manggu Makmur Tanjung Lestari.
- [11] Ernanda, D., & Sugiyono, S. (2017). The Influence of Store Atmosphere, Hedonic Motive and Service Quality on Purchasing Decisions. *Jurnal Ilmu dan Riset Manajemen (JIRM)*, 6(10).
- [12] Firnando, O., Novita, D., & Ahluwalia, L. (2021). Analysis of the Influence of Distribution Channels and Promotion on Product Purchasing Decisions (Survey on Consumers of PT Inti Bharu Mas Lampung). *Journal Strategy of Management and Accounting Through Research and Technology (SMART)*, 1(1), 31-37.
- [13] Fitria, A., Prawita, A. A., & Yana, S. (2021). The Effect of Lemon Aromatherapy on Emesis Gravidarum Trimester I. *Jurnal Bidan Cerdas*, 3(3), 96-102.
- [14] Gunawan, E. C. (2017). The relationship between self-efficacy and anxiety in undergraduate thesis students of the Faculty of Economics and Business at Satya Wacana Christian University (Doctoral dissertation, Psychology Study Program FPSI-UKSW).