

# Effectivity of Essential Oil Diffuser Blend Aromatherapy for Decrease Morning Sickness in The First Trimester of Pregnancy in Wonokromo Surabaya

Fritria Dwi Anggraini<sup>1</sup>, Fauziyatun Nisa<sup>1</sup>, Siska Nurul Abidah<sup>1</sup>

<sup>1</sup>Lecturer, Universitas Nahdlatul Ulama Surabaya, Indonesia

## Abstract

Generally, (64%) pregnant's women in the first trimester feel like nausea, vomiting, and loss of appetite (morning sickness). This is occurring because of increased levels of estrogen and hCG hormone (Human Chorionic Gonadotropin). If this situation is not resolved immediately, it will be mother's nutritional intake is not fulfilled and it will interfere the development of the fetal organs. Aromatherapy, sometimes can provide a relaxing effect and increasing the function of the digestive organs. This research aim was to determine the provision of inhalation aromatherapy using a diffuser (Essential Oil Diffuser Blend Aromatherapy) for decrease morning sickness in the first trimester of pregnancy in the area of Wonokromo, Surabaya. The design of this research is the Quasy experimental (pre-posttest control group design). The sample of pregnant's women are having a morning sickness in Wonokromo area was taken using the Simple Random Sampling technique of 60 people and then it will be divided into control and treatment groups. The treatment group will be given aromatherapy for 30 minutes based on the SOP. For the morning sickness variable instrument using PUQE (Pregnancy Unique Quantification of Emesis and or Nausea Scoring System). Data analysis using the Wilcoxon test with a significance level of  $\alpha = 0.05$  The result for the treatment group before given the aromatherapy were 26,7% with mild degrees, 40% moderate degrees, and 33% severe degrees. After given the aromatherapy, most of them had decreased to 6.7% severe degrees, 13.3% moderate degrees, 60% mild degrees, even of 20% still felt the discomfort. The results of the Wilcoxon sign rank test obtained the value of  $p = 0.001$ , so that means there is an effect of giving Aromatherapy Essential Oil Diffuser Blend with the degree of morning sickness in the first trimester of pregnancy. Giving of Aromatherapy Blend Essential Oil Diffuser is effective to decrease of morning sickness in the first trimester of pregnancy. For health worker, this technique can be one of the practical options for non-pharmacological therapy to decrease the discomfort of morning sickness which is and it can be done independently by pregnant women.

**Keywords:** *essential oil diffuser blend aromatherapy, morning sickness, pregnancy*

## Introduction

The Pregnancy is the growth and development process of the fetus intra uterin, it started from conception until the onset of labor<sup>1</sup>. In the first trimester, it is the most important phase because in this phase all the vital organs of the fetus are formed, starting to develop in their respective functions, so in this phase it requires adequate

nutrition. However in this phase pregnant women it is precisely feel nausea. vomiting and decreased appetite<sup>2</sup>.

In the process of pregnancy, the anatomy and physiology changes causing discomfort experience in their pregnancy is morning sickness feels like nausea and vomiting in the morning, this discomfort is often underestimated because morning sickness<sup>3</sup>. Pregnancy is influenced by various hormones, such as estrogen, progesterone, human chorionic gonadotrophin (hCG), human somatomammotropin, and prolactin. Human chorionic gonadotrophin, which is a special active hormone that plays a role during pregnancy, its levels

---

**Corresponding author:**

**Fritria Dwi Anggraini**

Email: fitria@unusa.ac.id

fluctuate during pregnancy<sup>4</sup>. the increase of hCG and estrogen levels drastically it will affect the part of the brain that controls vomiting, which generally happen in young pregnancy or in the first trimester<sup>5</sup>.

Based on data from World Health Organization (WHO) 2013, the number of hyperemesis gravidarum cases (excessive nausea and vomiting) reached 12.5% of the world's pregnancies, nausea vomiting/ emesis gravidarum Nausea and vomiting occurs 60-80% in primigravidas and 40-60% in multigravidas<sup>6</sup>. Emesis gravidarum is caused by increased levels of the HCG hormone in serum which stimulates the production of estrogen from the ovaries and causes stomach acid increase and makes pregnant women feel nauseous<sup>1,7</sup>. Unresolved emesis gravidarum will progress to hyperemesis gravidarum. The incidence of morning sickness in Indonesia, which was obtained from 2,203 pregnancies that can be completely observed is 543 mothers who experience morning sickness. In East Java in 2011, 67.9% of pregnant women experienced morning sickness.

The management of nausea and vomiting in pregnancy depends on the severity of symptoms. Treatment can be done by pharmacological or non-pharmacological. Pharmacological therapy is carried out by vitamin B6, antiemetics, antihistamines, anticholinergics, and corticosteroids. Non-pharmacological therapy is carried out by diet management, emotional support, acupuncture, and aromatherapy. Aromatherapy give some of diversify effects for the inhaler, such as calmness, freshness, even can help pregnant women solve the nausea<sup>8</sup>.

Aromatherapy can be used as a solution to treat nausea and vomiting in the first trimester. Aromatherapy is a treatment using essential oils that have unique pharmacological effects, such as antibacterial, antiviral, diuretic, vasodilator, sedative, and adrenal stimulating<sup>9</sup>. When essential oils are inhaled, the molecules stimulate the limbic system in the brain. The limbic system is an area that affects emotions and memory and is directly related to the adrenals, pituitary gland, hypothalamus, the parts of the body that regulate heart rate, blood pressure, stress, memory, hormonal balance, and respiration<sup>10</sup>.

Based on the description above, the researchers chose blended aromatherapy (lemon, ginger and lemongrass) as an effort to reduce nausea, vomiting and other inconveniences in the first trimester which given by inhalation using a diffuser. In addition, it is based on the nausea and vomiting in the first trimester in the community still occur and to solve them is mostly still using pharmacological therapy. It would be better if pregnant women are able solve the problem of nausea in early pregnancy by using non-pharmacological therapy first. Because non-pharmacological complementary therapy is noninstructive, non-invasive, cheap, simple, effective, and without any adverse side effects<sup>11</sup>.

## Materials and Methods

The design of this research is Quasy-Experiment with the Nonequivalent pretest posttest control design approach. The population and sample in this study were all pregnant women in the first trimester in the Wonokromo area and experience the morning sickness as many as 60 people, the sample divided into 2 groups, there are the treatment and the control groups, the group was assigned randomly while still paying attention to the respondent's willingness to be intervened. Before giving the therapy, the researcher observed both the treatment group and the control group. After that, the treatment group was given aromatherapy with the following conditions: 1) it was given through a diffuser in the form of a humidifier which would convert essential oils into steam. Researchers provide the same type of humidifier to all respondents. 2) Therapy is carried out in the respondent's house in a closed room with a maximum area of 20 m<sup>2</sup>. Respondents were asked to relax and inhale the air in the room for 30 minutes, as long as the intervention was accompanied by researchers. In the control group, researchers asked for relaxation by resting for 30 minutes. After giving aromatherapy, researchers re-observed the treatment group and the control group. The intervention was given in accordance with the SOP, a morning sickness measurement instrument using a PUQE (Pregnancy Unique Quantification of Emesis and or Nausea Scoring System) questionnaire<sup>12</sup>. Data analysis using statistical test Wilcoxon Sign Rank Test with a significance level of  $\alpha = 0.05$

## Results and Discussion

**Table 1. The distribution of respondents based on age, job and parity.**

Characteristics	Category	Amount	%
Age	<20 years	12	20
	20-35 years	46	76.7
	>35 years	2	0.03
Parity	Primigravida	32	53.3
	Multigravida	28	46.7
	Grandemulti gravida	0	0
Job	Not working	36	60
	Working	24	40

Based on the table above, almost all respondents are aged 20-35 years (reproductive age), most respondents are primigravida pregnancy (first pregnancy), and most not working.

**Table 2. The frequency distribution of discomfort of nausea and vomiting in the intervention group before and after giving aromatherapy to pregnant women in the first trimester at wonokromo surabaya area was obtained.**

Intervention	Degree of Morning Sickness	Amount	%
Before giving aromaterapy	Not nausea and vomite	0	0
	Mild	8	26.7
	Moderate	12	40
	Severe	10	33
After giving aromaterapy	Not nausea and vomite	6	20
	Mild	18	60
	Moderate	4	13.3
	Severe	2	6.7

These results indicate that before giving aromatherapy, nearly half of the respondents, (40%) experienced moderate degrees of morning sickness and 33% had severe degrees. After giving aromatherapy, most of the morning sickness was mild, even 20% of respondents said they had no nausea and vomiting, although there were still 13.3% with moderate morning sickness and 6.7% severe.

**Table 3. The frequency distribution of complaints discomfort of nausea and vomiting in the control group before and after giving standard care, which is a short break, without giving aromatherapy.**

Intervention	Degree of Morning Sickness	Amount	%
Before relaxation	Not nausea and Vomite	0	0
	Mild	8	26,7
	Moderate	15	50,0
	Severe	7	33,3
After relaxation	Not nausea and Vomite	0	0
	Mild	12	40
	Moderate	16	53,3
	Severe	2	6,7

These results indicate that before giving aromatherapy, nearly half of the respondents, 40%) experienced moderate degrees of morning sickness and 33% had severe degrees. After giving aromatherapy, most of the morning sickness was mild, even 20% of respondents said they had no nausea and vomiting. The average score of the frequency of nausea as measured by the PUQE questionnaire before treatment was 21.76 and after it decreased to 13.27 (decreased by 8.49), while the control group decreased by 3.84. The results of the Wilcoxon sign rank test with SPSS for Windows with a significance level of  $\alpha = 0.05$  obtained a value of  $\rho = 0.001$  ( $0.001 < 0.05$ ), that mean the provision of Aromatherapy Essential Oil Diffuser Blend is effective in reducing morning sickness in first trimester on pregnant women in Wonokromo Surabaya.

The results showed that in the treatment group and the control group most of the respondents experienced morning sickness, but the difference was that the treatment group experienced mild morning sickness while the control group experienced moderate morning sickness. Herbal ingredients in the form of aromatherapy essential oils such as eucalyptus, citrus, *Zingiber/ginger*, lemongrass, lavender, are also useful for treating nausea, reducing stress, overcoming flatulence, treating headaches<sup>10</sup>.

These various herbal ingredients are often given separately according to the needs and tastes of the user, as well as by different methods of inhalation. In this study, aromatherapy was given 3 types together (blend aromatherapy), selected ingredients that have a positive effect with a non-contradictory aroma so that they can provide more benefits from each ingredient together, and the results show that the essential oil. Aromatherapy Blend Diffuser is effective in reducing morning sickness. The combination of the aroma of lemon, lemongrass (lemongrass) and ginger (ginger) which is generally given in the form of a drink, in fact also gives a refreshing aroma effect, Respondents stated that they felt nausea and vomiting reduced and felt comfortable after giving aromatherapy and giving aromatherapy to the condition of pregnant women. fresher. 15 respondents of pregnant women who experienced nausea and vomiting at BPS Lia Maria Sukarame Bandar Lampung in 2017 after giving lemon inhalation by inhaling essential oils directly, there was a significant reduction in nausea and vomiting from the average. The average nausea score was 24,67 then the average frequency score for nausea and vomiting after giving lemon inhalation was 17,87<sup>13</sup>.

Lemongrass oil/lemongrass has a light and fresh smell like lemon and is known to trigger relaxation and balance. The compounds that make up lemongrass essential oil are known to have anti-fungal, insect

repellent, antiseptic, and anti-inflammatory properties. Lemongrass is able to prevent the growth of several bacteria and fungi and is antioxidant. Ginger contains substances that can treat nausea and vomiting, including the terpenoid components, such as gingerol, shogaol, galanolactone. In addition, the essential oil with the aroma of ginger has a refresh effect and produces an aroma that blocks the gag reflex. The oleoresin causes a warm spicy taste<sup>14</sup>. Ginger contains substances that can treat nausea and vomiting, including the terpenoid components, such as gingerol, shogaol, galanolactone. In addition, the essential oil with the aroma of ginger has a refresh effect and produces an aroma that blocks the gag reflex. The oleoresin causes a warm spicy taste<sup>15</sup>.

Based on the literature review, Aromatherapy regulates physiological, spiritual and psychological enhancement for new phases of life. This therapy is not only preventive but also be used in acute and chronic stages of the disease without causing side effects. Only 8 molecules can trigger an electrical impulse at the nerve endings that must be stimulated before a person realizes what smell is being smelled. The brain in the medulla is part of the nausea center which is caused by irritative impulses coming from the gastrointestinal tract and impulses origin from the lower brain associated with morning sickness<sup>16</sup>. Use aromatherapy by inhalation is absorbed quickly by nerve impulses in the brain. The nose is one of the body's senses that can transmit responses quickly to the brain. If the smell a certain, the brain will automatically respond, so that the Aromatherapy Essential Oil Diffuser Blend is effective in reducing morning sickness in first trimester on pregnant women.

### Conclusion

In conclusion, pregnant women who were given Aromatherapy Blend Essential Oil Diffuser decrease in complaints discomfort of morning sickness as measured by the PUQE questionnaire of 8.49. The provision of Aromatherapy Blend Essential Oil Diffuser is effective in reducing morning sickness in first trimester pregnant women in the Wonokromo, Surabaya, Indonesia. researcher expect to develop further research regarding other benefits of aromatherapy and develop innovations in various herbal ingredients in improving public health.

**Conflict of Interest :** The authors declare that they have no conflict of interest.

**Source of Funding :** This study supported by the Kemenristekdikti through the selection of PDP grant program (Research for Junior Lecturers) in the F.Y. 2020.

**Acknowledgements :** Our gratitude goes to several parties, including: Head of Wonokromo Village and all pregnant women as respondents, Rector and chairperson of LPPM UNUSA for facilitating and giving permission in the implementation of this study, and Arif Nur Muhammad Ansori for editing the manuscript.

**Ethical Approval:** This study was approved by the Universitas Nahdlatul Ulama Surabaya, Indonesia.

### References

1. Prawirohardjo, S. Ilmu Kebidanan. Jakarta: PT. Bina Pustaka Sarwono Prawirohardjo; 2010.
2. Wilkinson JM. What do we know about herbal morning sickness treatments? A literature survey. *Midwifery*. 2020; 16(3): 224–228.
3. Bai G, Korfage IJ, Hafkamp-De Groen E, Jaddoe VWV, Mautner E, and Raat H. Associations between nausea, vomiting, fatigue and health-related quality of life of women in early pregnancy: The generation r study. *PLoS ONE*. 2016; 11(11), 1–15.
4. Sukarni I. Buku Ajar Keperawatan Maternitas. Yogyakarta: Nuamedika; 2013.
5. Irmawati. Kehamilan Bermasalah. Yogyakarta: Laksana; 2016.
6. Campbell K, Rowe H, Azzam H, and Lane CA. The management of nausea and vomiting of pregnancy. *Journal of Obstetrics and Gynaecology Canada*. 2016; 38(12): 1127–1137.
7. Birkeland E, Stokke G, Tangvik RJ, *et al*. Norwegian PUQE (pregnancy-unique quantification of emesis and nausea) identifies patients with hyperemesis gravidarum and poor nutritional intake: A prospective cohort validation study. *PLoS ONE*. 2015; 10(4): 1–16.
8. Muchtariadi. Aroma Terapi; Tinjauan Aspek Kimia Medisinal. Yogyakarta: Graha Ilmu; 2015.
9. Sujik Nuryanti R. & E. (2016). Efektifitas Aromaterapi Inhalasi Peppermint Dan Ingesti

- Lemon Terhadap Penurunan Mual Pada Ibu Hamil Trimester Pertama Di BPM Ny. Marminah Purwodadi. Ilmu Keperawatan dan Kebidanan. 1–11.
10. Jaelani. Aroma Terapi. Jakarta: Pustaka Popular Obor; 2009.
  11. Rezaie-Keikhaie K, Hastings-Tolsma M, Bouya S, *et al.* Effect of aromatherapy on postpartum complications: A systematic review. *Complementary Therapies in Clinical Practice.* 2019; 35: 290–295.
  12. Tiran D. Ginger to reduce nausea and vomiting during pregnancy: Evidence of effectiveness is not the same as proof of safety. *Complementary Therapies in Clinical Practice.* 2012; 18(1): 22–25.
  13. Maternity D. Inhalasi lemon mengurangi mual muntah pada ibu hamil trimester satu. *Jurnal Ilmiah Bidan.* 2017; 2(3): 10–15.
  14. Vieira AJ, Beserra FP, Souza MC, Totti BM, and Rozza AL. Limonene: Aroma of innovation in health and disease. *Chemico-Biological Interactions.* 2018; 283: 97-106.
  15. El Hajj M, Sitali DC, Vwalika B, and Holst L. Herbal medicine use among pregnant women attending antenatal clinics in Lusaka Province, Zambia: A cross-sectional, multicentre study. *Complementary Therapies in Clinical Practice.* 2020; 40: 101218.
  16. Ali B, Al-Wabel NA, Shams S, Ahamad A, Khan SA, and Anwar F. Essential oils used in aromatherapy: A systemic review. *Asian Pacific Journal of Tropical Biomedicine.* 2015; 5(8): 601–611.