

Effect of Lavender Aromatherapy Combination with Respiratory Relaxation on Postpartum Maternal Anxiety in Infant Care

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ABSTRACT

Introduction: Postpartum mothers often experience physical and psychological problems. The new role as a mother is a trigger for anxiety. Anxiety that is not resolved immediately will trigger other problems such as stress and depression, so efforts are needed to make the maternal mood better through the use of lavender aromatherapy and respiratory relaxation techniques.

Objectives: This research aims to analyze the effect of the combination of lavender aromatherapy with respiratory relaxation on postpartum maternal anxiety in infant care.

Methods: This research is quantitative. The design of the quasy research was experimental with pre and post test without control group. The research was carried out on December 5 – 19, 2024. The research sample was primipara postpartum maternal at PMB L Sragen with 32 respondents. The sampling technique used nonprobability sampling with purposive sampling. The instrument used observation sheets, lavender aromatherapy, SOPs, and HARS questionnaires. Data analyzed using the Wilcoxon Test.

Results: Respondents anxiety before and after used the lavender aromatherapy combination with respiratory relaxation had a median of 22 in the pre-test and 13.5 in the post-test. The result of the Wilcoxon Test gotten a p-value of 0.000 (<0.05), then H_0 was rejected and H_a was accepted.

Conclusions: The combination of lavender aromatherapy with respiratory relaxation has an effect on reducing postpartum maternal anxiety in infant care.

Introduction

The puerperium period begins from 1 hour after the birth of the placenta until 6 weeks or 42 days. Postpartum organizations must be carried out suitably so that needs of maternal and infant are met, such as expectation, early disclosure and treatment of complications and contaminations which is able happen in the midst of the postpartum period. In the postpartum period, postpartum maternal must adapt physiologically, psychologically and socially, but not all postpartum maternal can go through the adjustment of the postpartum period easily. There are postpartum maternal who involvement mental clutters amid the postpartum period. A psychological disorder that postpartum maternal often experience is anxiety (Ciselia & Oktari, 2021). The World Health Organization (WHO) estimates that by 2025 the prevalence of anxiety disorders will be 24% at some point in life (WHO, 2023). The comes about of a consider conducted by Hashemi *et al.*, (2023) in Iran were gotten from 231 respondents (32.7%) of moms encountering postpartum anxiety.

Anxiety in postpartum maternal that cannot be settled can cause postpartum depression and other mental disorders that meddled with wellbeing. The prevalence of postpartum anxiety in Indonesia in 2020-2023 reached 28.7%. Primapara mothers who experienced serious uneasiness come to 83.4% and direct uneasiness 16.6%, whereas multipara mothers



experienced severe anxiety 7%, moderate anxiety 71.5% and mild anxiety 21.5% (Kemenkes RI, 2023). Postpartum anxiety in Central Java reaches 26% and in Sragen Regency reaches 29% (Dinkes Jawa Tengah, 2023).

The factors that affect predisposing anxiety are psychosocial, interpersonal, behavioral, and family circumstances, while the precipitation factors are divided into two, internal factors, the first is related to the threat of self-integrity about physiological inability to meet basic daily needs such as illness, physical trauma and accidents. The second is systemic threats that consist of threats to self-identity, self-esteem, loss of status and role changes, group pressure and socio-culture. The external factors are the potential for stressors, maturation, education, the role of parents, the role of husbands, the role of health workers, socioeconomic status and personality types (Dewi *et al.*, 2024; Satriani, 2021).

Efforts that can be made to decrease anxiety in postpartum maternal are by pharmacological and non-pharmacological methods. Pharmacological treatment has a negative impact if used continuously and can trigger dependence. According to several previous studies, there are several non-pharmacological methods that can be used to reduce postpartum anxiety, including music therapy, progressive muscle relaxation, yoga exercises, aromatherapy, and relaxation (Nababan *et al.*, 2024). One of the non-pharmacological methods that can be utilized to reduce anxiety levels is respiratory relaxation. Respiratory relaxation can offer assistance the body to relax so that it can control breathing, blood weight, heart rate and body temperature. Relaxation of breathing can create a calm, light, and warm sensation that spreads throughout the body (Zappas *et al.*, 2021).

This is often in line with the investigate of Pardede *et al.*, (2020) which communicated that there was an affect of unwinding on the level of primipara uneasiness, there was a alter within the patient's anxiety level pre and post the administration of breathing relaxation techniques. The level of anxiety before the intercession was given, the majority of respondents experienced moderate anxiety were 26 respondents (65%), while after the arrangement of breathing relaxation techniques, most of the respondents experienced a change in anxiety level, the majority of respondents experienced mild anxiety were 25 respondents (62.5%).

When a person relaxes breathing to control anxiety, in the body there is an increase in parasympathetic nervous components in a stimulant way, at that point the hormones adrenaline and cortisol that can cause stress will decrease so that there can be an increment in concentration and feel calm to direct breathing until breathing is less than 60 - 70 times/minute, at that point PaCO₂ levels will increment and decrease pH so as to extend oxygen levels within the blood. Within the spinal line, receptor cells that get gold incitement are hindered by incitement from other nerve strands. Pleasant stimulation from the outside can also stimulate endorphin secretion, so that the anxious stimulation felt by the patient is reduced (Sari *et al.*, 2022).

Another non-pharmacological strategy that can reduce anxiety is aromatherapy. Aromatherapy has a positive impact since it is known that smells that are new, fragrant, invigorate the faculties, receptors, and influence other organs so that they can have a strong effect on anxiety. Scents are picked up by receptors within the nose, at that point give assist data to zones within the brain that control feelings and memory as well as data to the hypothalamus as a regulation of the body's inside frameworks, counting uneasiness and push. Lavender aromatherapy can increment alpha waves within the brain and these waves offer assistance make a sense of relaxation that shows a decrease in anxiety in postpartum mothers (Liang *et al.*, 2023; Rahimi & Moenimehr, 2022).

Lavender features a calming impact, giving adjust, a sense of consolation, a sense of openness and certainty. Lavender can too diminish torment, depression, anxiety/panic, stretch, unsteady feelings, delirium, and disappointment. Research by Karaaslan & Arikan (2022)



explains that mothers who go into labor using lavender oil can diminish torment within the perineal region and reduce anxiety. Aromatherapy using lavender oil has a relaxing effect on tense nerves and muscles (carminative) after tiring activities or when feeling worried and panicked about something, so lavender aromatherapy is useful as a sedative for someone who feels anxious

The impact of aromatherapy based treatment on consolation can be measured by looking at different pointers that appear consolation. The pointer is that the elucidation of aromatherapy will appear the passionate reaction of battle or flight, the translation of the sense of consolation gotten from the impacts of aromatherapy. Aromatherapy too progresses execution, concentration, calmer intellect, and cools the soul. Non-verbal responses show comfort (the patient does not frown, does not move away, does not close the eyelids, and does not turn the face/whole body) (Hedigan *et al.*, 2023).

Based on the comes about of a preparatory think about through interviews with 10 postpartum maternal, it was found that 6 postpartum maternal experienced anxiety because the postpartum maternal in PMB L Sidoharjo Village were young mothers who gave birth to their first child. Some postpartum mothers say they are anxious because they are afraid of failing to take care of the infant, which is the first experience of being a maternal. They also experience anxiety because they are afraid of being a bad maternal, unable to meet the baby's breastfeeding needs, unable to bathe the infant, unable to take care of the baby's umbilical cord, and are also anxious if the infant continues to cry. Some of these postpartum maternal said that to overcome anxiety by asking for the help of their husband, in-laws or mothers to take care of their babies, it is necessary to have non-pharmacological therapy to overcome these problems so that the mental health of postpartum maternal remains in a stable condition and minimizes the occurrence of side effects from pharmacological therapy. Previous research with existing facts also has a gap, there is a study that states that there is no relationship between relaxation techniques and anxiety, while according to the theory of relationship and the facts that exist at the time of the preliminary study stated that 7 out of 10 postpartum mothers stated that they felt relaxed after doing breathing techniques combined with lavender aromatherapy.

Previous research on anxiety has been conducted, but there are still very few studies related to postpartum anxiety in infant care, because more focus on the physical condition of the maternal or infant, even though the psychology of postpartum maternal really needs to be considered so that depression and other problems do not occur due to the impact of these psychological disorders. The anxiety that is widely studied is anxiety during pregnancy or before childbirth using one of the non-pharmacological interventions, such as only giving aromatherapy or only applying relaxation, and the majority of these interventions are associated with pain. The relaxation that is widely applied is also not respiratory relaxation but autogenic and benson relaxation, so the author innovated to combine the two interventions and was associated with postpartum anxiety. Researchers chose lavender aromatherapy combined with respiratory relaxation because lavender aromatherapy has a pleasant aroma that can maintain balance, reduce anxiety and depression. The use of lavender oil in aromatherapy can have a positive effect on individuals who experience anxiety disorders, because lavender oil can improve mood and help reduce muscle tension, especially when combined with respiratory relaxation which can cause a relaxing effect so that it is hoped that it can be more successful in decreasing anxiety in postpartum maternal. This study aims to analyze the effect of the combination of levender aromatherapy with respiratory relaxation on postpartum maternal anxiety in infant care.

Methods



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This study used quantitative research. The design of the quasy research was experimental with a pre and post-test approach without control group. The research was conducted on December 5 – 19, 2024 at PMB L Sragen. The population in this study is all postpartum maternal at PMB L Sragen in December 2024. The sample is primipara postpartum maternal at PMB L Sragen in December 2024 as many as 32 respondents, using inclusion and exclusion criteria. The inclusion criteria in this study are postpartum maternal who are in PMB L Sragen, primipara maternal, and willing to be respondents. The exclusion criteria in this study are postpartum maternal who experience respiratory disorders or aromatherapy allergies, postpartum complications occur, postpartum maternal use other aromatherapy, mothers refuse to be respondents or drop out during the study. The sampling technique uses nonprobability sampling with purposive sampling. The instrument used observation sheets, lavender aromatherapy, SOPs, and HARS questionnaires to measure respondents' anxiety levels. A combination of lavender aromatherapy and respiratory relaxation was given to respondents once per day for 15-20 minutes. Bivariate analysis used the Wilcoxon test, because the data normality test using the Shapiro-Wilk test obtained a p-value of 0.047 in the pre-test and 0.012 in the post-test, the data is abnormally distributed (p-value < 0.05) and does not used the requirements of the parametric test.

Results

1. Characteristics of Respondents

a. Age

Table 1. Characteristics of Respondents Based on Age

Age	Frequency	Percentage (%)
<20 years	2	6.3
20-35 years	17	53.1
>35 years	13	40.6
Total	32	100

Table 1 shows that most respondents aged 20-35 years were 17 respondents (53.1%).

b. Education Level

Table 2. Characteristics of Respondents Based on Education Level

Education Level	Frequency	Percentage (%)
Elementary (SD and SMP)	8	25
Secondary Education (SMA)	14	43.8
High (Bachelor)	10	31.3
Total	32	100

Table 2 shows that most of the respondents have secondary education (SMA) were 14 respondents (43.8%).

c. Work

Table 3. Characteristics of Respondents Based on Work

Work	Frequency	Percentage (%)
IRT	9	28.1
Private	17	53.1
Self-employed	4	12.5
PNS	2	6.3
Total	32	100

Table 3 shows that most of the respondents have private jobs were 17 respondents (53.1%).



2. Univariate Analysis

a. Anxiety Before Intervention

Table 4. Respondents Anxiety Before Using a Combination of Lavender Aromatherapy and Respiratory Relaxation

Anxiety	Frequency	Percentage (%)
Mild	13	40.6
Moderate	16	50
Severe	3	9.4
Total	32	100

Table 4 shows that before using a combination of lavender aromatherapy and respiratory relaxation, most of the respondents experienced moderate anxiety were 16 respondents (50%).

b. Anxiety After Intervention

Table 5. Respondents Anxiety After Using a Combination of Lavender Aromatherapy and Respiratory Relaxation

Anxiety	Frequency	Percentage (%)
No Anxiety	9	28.1
Mild	15	46.9
Moderate	8	25
Total	32	100

Table 5 shows that after being given a combination of lavender aromatherapy and respiratory relaxation, most of the respondents experienced mild anxiety were 15 respondents (46.9%).

3. Normality Test

Table 6. Normality Test

Variable	Group	Shapiro-Wilk		
		Statistics	df	Sig.
Anxiety	Pre-test	0.933	32	0.047
	Post-test	0.911	32	0.012

Table 6 shows that the results of the normality test using the Shapiro-Wilk test gotten a p-value 0.047 in the pre-test and 0.012 in the post-test, so the data was said to be abnormally distributed because the p-value < 0.05. The two groups were abnormally distributed, so the bivariate analysis used the Wilcoxon Test.

4. Bivariate Analysis

Table 7. Differences in Respondents Anxiety Levels Before and After Using a Combination of Lavender Aromatherapy and Respiratory Relaxation

Anxiety	N	Mean	Median	Min (Max)	Z-Score	p
Pre-test	32	20.66	22	14(28)	-4.945	0.000
Post-test	32	15.28	16	8(23)		

Table 7 shows that the anxiety of respondents pre and post being given a combination of lavender aromatherapy and respiratory relaxation had a mean value in the pre-test of 20.66 and the post-test of 15.28. The median score in the pre-test was 22 and the post-test was 16. The lowest anxiety level in the pre-test was 14 and the highest was 28, while the lowest anxiety level in the post-test was 8 and the highest was 23. The results of the hypothesis test



using the Wilcoxon test gotten $p\text{-value} = 0.000 < 0.05$ so H_0 was rejected and H_a was accepted, so there was a significant difference between the results of the combination of lavender aromatherapy and respiratory relaxation in the pre-test and post-test values which means that there is an effect of the combination of lavender aromatherapy and respiratory relaxation on postpartum maternal anxiety in infant care at PMB L Sragen.

Discussion

1. Characteristics of Respondents

The results of this study were obtained that most of the respondents were 20-35 years old, 17 respondents (53.1%). Reproductive age refers to the age at which a person reaches physical and psychological maturity, and was generally able to deal with problems well. According to research by Hedigan *et al.*, (2023), the most postpartum maternal are 20-35 years old with mild levels of anxiety. The study also showed a significant relationship ($p=0.001$) between the mother's age and the level of anxiety in primipara mothers, but according to Sari *et al.*, (2022), a mother's maturity is not only determined by age. There are mothers who young but have been mentally and emotionally prepared to become a mother, so they do not experience significant anxiety during the postpartum period. This shows that maturity as a mother was not always in line with age.

This study shows that most of the respondents have secondary education (SMA) were 14 respondents (43.8%). This research was in line with the research of Hashemi *et al.*, (2023) that respondents with higher education do not experience severe anxiety, while the majority of respondents with low education experience moderate to severe anxiety. Education was a process that aims to develop one's abilities and behaviors through teaching. Education has a great influence on a person's knowledge, because education can help a person to more easily accept new information or technology in the face of increasingly complex societal demands. The level of education also affects the way a person makes decisions and seeks solutions to problems in his life. People with higher education tend to act more rationally and are more open to new ideas (Swarjana, 2022).

This study also shows that most of the respondents have private jobs were 17 respondents (53.1%). The results of this study was in line with the research of Nababan *et al.*, (2024) that working respondents did not experience severe anxiety, while respondents who did not work experienced moderate to severe anxiety. A person's job status can affect their thinking and well-being, although work can help develop a person's thinking, but on the other hand, work can also interfere with other roles that a person has that can lead to an inability to cope with stress, such as anxiety. Working mothers sometimes also feel worried if they cannot take good care of their babies if the leave period is over.

2. Anxiety Before Intervention

This study showed that before being given a combination of lavender aromatherapy and respiratory relaxation, most of the respondents experienced moderate anxiety were 16 respondents (50%). This research is in line with the research by Hedigan *et al.*, (2023), that before being given lavender aromatherapy and respiratory relaxation, most of the respondents experienced moderate anxiety were 18 respondents (56%). Research by Hashemi *et al.*, (2023) also stated that before being given a combination of lavender aromatherapy and respiratory relaxation, most of the respondents experienced moderate anxiety were 17 respondents (54,2%).

Psychological adaptation becomes the main focus during the postpartum period, as hormonal changes and new life situations or changes in the role of parenthood can affect the emotional well-being of the mother and cause the mother to experience goldenness or



confusion in caring for her baby. Not only can this condition interfere with daily activities, but it can also negatively impact interactions with babies and the overall quality of family relationships. The intervention given to postpartum maternal can be done by providing psychological support from the family and health workers that the mother is able to take care of her baby and is aware of her role as a mother as well as changes in her body shape after giving birth. In addition to psychological support, golden symptoms can also be minimized by the use of aromatherapy, such as using lavender aromatherapy. Lavender aromatherapy has anti-depressant properties to help reduce anxiety, fear, and anxiety so that blood circulation and breathing become smooth, so that there is an improvement in the physical and psychological condition of the maternal and baby in accordance with the stage of care planned by health workers (Cho & Kim, 2023; Zappas *et al.*, 2021).

3. Anxiety After Intervention

This study showed that after being given a combination of lavender aromatherapy and respiratory relaxation, most of the respondents experienced mild anxiety were 15 respondents (46.9%). This research is in line with the research by Qian *et al.*, (2021), that after being given lavender aromatherapy and respiratory relaxation, most of the respondents experienced mild anxiety were 17 respondents (54,7%). Research by Ebrahimi *et al.*, (2022) also stated that after being given a combination of lavender aromatherapy and respiratory relaxation, most of the respondents experienced mild anxiety were 19 respondents (56,3%).

Aromatherapy based treatment is an elective strategy to progress physical and mental wellbeing through smell. Fragrance based treatment can be utilized in a assortment of ways, such as scenting the room, relaxation and meditation, bathing, massage oils, and others. Aromatherapy was made from plant ingredients that were processed into essential oils with a distinctive aroma. Studies have shown that aromatherapy has a positive impact on human health, both through aroma and use on the skin. Aromatherapy can foster feelings of calm (relaxation) in the body, mind and spirit, create a peaceful atmosphere, and can keep away from feelings of anxiety and restlessness. Essential oils used for aromatherapy can affect the activity of brain work functions through the nervous system related to the sense of smell. This response can stimulate increased production of neurotransmitters related to the recovery of psychic conditions such as emotions, feelings, thoughts and desires (Mediastari, 2020). In addition, according to (Mujahidah & Mendrofa, 2020) the benefits of aromatherapy in addition to improving physical and psychological conditions, aromatherapy can provide a relaxing effect on tense nerves and muscles. Therefore, one of the ways of relaxation used to reduce anxiety was to used aromatherapy.

4. Effect Therapy

This study found that before being given a combination of lavender aromatherapy and respiratory relaxation, most of the respondents experienced moderate anxiety. After being used a combination of lavender aromatherapy and respiratory relaxation, most of the respondents experienced mild anxiety, resulting in a decrease in anxiety in the respondents. The results of the hypothesis test used the Wilcoxon test were also gotten with a p-value = $0.000 < 0.05$ so H_0 was rejected and H_a was accepted, so there was a significant difference between the results of the combination of lavender aromatherapy and respiratory relaxation in the pre-test and post-test scores which means that there was an effected of the combination of lavender aromatherapy and respiratory relaxation on postpartum maternal anxiety in infant care at PMB L Sragen.

Aromatherapy is one of the popular options to reduce discomfort without using drugs. The use of refreshing scents can stimulate sensors and receptors in the nose, and those



signals are then sent to the brain to regulate emotions as well as inform the hypothalamus to regulate the body's internal systems and respond to stress. The aroma of essential oils is also known to have a positive impact on the central nervous system by inhibiting the release of Adrenocorticotrophic Hormone (ACTH), which can cause anxiety in a person.

Aromatherapy based treatment can moreover offer assistance soothe stretch and move forward by and large well-being. The aroma of essential oils automatically reduces muscle tension and improves mood. Regular use of aromatherapy can help to create a calm and pleasant environment, which can contribute to a person's mental and emotional well-being (Fung *et al.*, 2021; Vora *et al.*, 2024).

Aromatherapy with lavender flower oil is an alternative form of therapy that used scents to affect a person's health and well-being. Lavender has long been utilized in conventional medication to address a assortment of wellbeing issues, including sleep disorders, anxiety, and stress. Lavender is believed to have a relaxing and stimulating effect, so it is suitable for use as a sedative for someone who feels anxious and stimulating for those who are depressed. In addition, lavender aromatherapy is also believed to help with joint pain, headaches, and other pain problems. Another non-pharmacological effort that can reduce anxiety is respiratory relaxation. Breathing relaxation is a breathing technique that can help with stress, anxiety, and pain. At the time of doing breathing relaxation, one can imagine that the burden of the mind is released and can focus attention on reducing tension and experiencing relaxation (Gurkok & Sezen, 2023; Popova-Dobрева, 2023).

The comes about of this think about are in line with the inquire about of Malahayati & Nainggolan (2020) that there's an impact of aromatherapy on postpartum maternal anxiety with a p-value of 0.001. Aromatherapy can be a safe and effective alternative to help reduce anxiety and improve postpartum maternal mood. The used of essential oils is specifically for mothers who experience emotional and physical changes after childbirth. The linalool content in lavender oil has been proven to have a calming effect, reduce anxiety, improve mood, relieve muscle tension and improve sleep quality. The process of inhaling lavender aromatherapy directly affects the central nervous system, especially the limbic part of the brain. The limbic system is the center of emotion, motivation, and memory regulation. Lavender aromatherapy can stimulate nerve receptors in the nose which then send signals to the brain to respond to the scent. This response then triggers the release of neurotransmitters such as serotonin and dopamine, which can promote feelings of happiness and relaxation.

This inquire about is in line with the inquire about of Qian *et al.*, (2021) that the combination of relaxation with lavender aromatherapy has a significant effect on reducing anxiety scores in postpartum maternal in caring for babies. The average before the intervention was 54.36 with a standard deviation of 4.153, whereas the normal after the intervention was given decreased by 51.47 with a standard deviation of 3.283. Lavender aromatherapy can affect the hormonal system in the body and has been shown to lower levels of stretch hormones such as cortisol, which play a role in responding to stressful situations. This will offer assistance diminish indications of push and uneasiness and make strides rest quality. The relaxing effects of aromatherapy can also help reduce blood pressure and heart rate, which are physical signs of stress. Researchers believe that the more often the combination therapy is carried out, it can have a great influence on the decrease in anxiety scores in postpartum maternal in caring for infant experienced by respondents (Custin & Nurdiana, 2024).

The comes about of this consider are moreover in understanding with inquire about Ebrahimi *et al.*, (2022) that the level of anxiety after the intervention was obtained by the majority of respondents still experiencing mild anxiety after relaxation. Respiratory



relaxation is a breathing technique that can help overcome anxiety, stress, pain, improve lung ventilation and blood oxygenation. When doing breathing relaxation, one can imagine the weight of the mind being released, can feel changes and sensations in the chest and other limbs. The basic principle of anxiety reduction after relaxation is smooth blood flow and the presence of endorphine hormone stimulation. When an individual relaxes, beta-endorphine will come out and be captured by receptors within the hypothalamus and limbic system that work to direct anxiety and as a natural sedative.

Based on the description above, the researcher assumes that the level of anxiety of each person varies according to their respective coping mechanisms. There are people who express their anxiety and there are those who keep it in their hearts. Anxiety is also a normal reaction to stressful conditions and is indicated by an emotional reaction. If this condition is not constantly treated, the condition can increase until there is a behavioral disorder, so there needs to be an effort to deal with the problem, by providing a combination of lavender aromatherapy with respiratory relaxation. The combination of these interventions has too been appeared to have a significant effect on reducing anxiety in postpartum maternal in infant care.

Conclusion

The conclusion of this study is that there is an effect of the combination of lavender aromatherapy with respiratory relaxation on postpartum maternal anxiety in infant care at PMB L Sragen with p-value 0.000. This was shown by a significant difference or decrease in anxiety between the results of the combination of lavender aromatherapy and respiratory relaxation in the pre-test and post-test scores. Postpartum maternal are expected to be able to independently apply or practice the use of lavender aromatherapy and respiratory relaxation in daily life, so that when experiencing anxiety, mothers can control their anxiety levels so that they can still take good care of their infant, do not experience depression, muscle tension, and insomnia.

Ethics approval and consent to participate

The approval of this research was obtained from the Research Ethics Commission of the University of Muhammadiyah Lamongan No. 324/EC/KEPK-S2/12/2024.

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