The Effect of Rose Aromatherapy on Anxiety Levels During the First Stage of Labor

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Abstract:

Maternal anxiety during labor is a common issue that can negatively affect the birthing process and maternal well-being. Rose aromatherapy effectively relaxes the muscles and mind, helping to loosen the uterine muscles and reduce the intensity of pain. This study aimed to determine the effect of rose aromatherapy on anxiety levels during the active phase of the first stage of labor. A quasi-experimental design with a non-equivalent control group was employed, involving 30 respondents who were divided equally into an intervention group and a control group. The research was conducted at Gurah and Sambi Community Health Centers from March to June 2023. Anxiety levels were measured using the DASS-21 scale, and data were analyzed using the Mann-Whitney test with a significance level of $\alpha = 0.05$. The results showed that before the intervention, most respondents in the intervention group experienced moderate anxiety, while all respondents in the control group experienced severe anxiety. After administering rose aromatherapy, there was a significant reduction in anxiety levels among respondents in the intervention group compared to the control group (p-value = 0.000). These findings indicate that rose aromatherapy effectively reduces anxiety during the active phase of labor. It functions as a non-pharmacological method that stimulates the limbic system, promoting relaxation and a sense of comfort. The study concludes that rose aromatherapy can be recommended as a complementary intervention for mothers in labor to help manage anxiety. It also serves as a valuable reference for educational institutions, researchers, and healthcare professionals in developing evidence-based practices for maternal care.

INTRODUCTION

Anxiety arises from complex and prolonged feelings of discomfort, which stem from excessive fear. During labor, feelings of anxiety and fear trigger an increase in adrenaline, which results in cervical stiffness. This condition not only slows down labor but also intensifies pain and uterine contractions (Cheung et al., 2020; Abidin et al., 2022). In addition, anxiety and fear can disrupt the emotional and physiological balance of the mother, as well as reduce the supply of oxygen to the mother and fetus (Veringa-Skiba et al., 2022).

Anxiety can be managed through two main approaches: pharmacological and non-pharmacological (Slee et al., 2019). Pharmacologically, anxiety is treated with antidepressants, such as those in the benzodiazepine class. Meanwhile, non-pharmacological methods for relieving anxiety include various techniques, such as relaxation, distraction, breathing control, and the use of aromatherapy (Garakani et al., 2020).

Aromatherapy is defined as a complementary therapy that uses essential oils to improve emotional well-being and restore balance to the body. This therapy has various benefits, including helping with uterine contractions, relieving pain, reducing tension and anxiety, creating a sense of well-being, and being specifically effective in reducing anxiety during childbirth (Yildiz et al., 2023)

Inhaled aromatherapy works by stimulating the limbic system, which is the emotional center of the brain that is directly linked to the endocrine and autonomic nervous systems. This activation allows aromatherapy to reduce anxiety, which often triggers pain effectively. Additionally, the aroma from this therapy stimulates the thalamus to release enkephalins, which act as natural pain relievers, thereby creating a sense of comfort and reducing pain. Some commonly used types of aromatherapies include lavender, rose, jasmine, and citrus aurantium (Yildiz et al., 2023).

Rose aromatherapy is highly recommended for labor pain due to its geraniol and linalool compounds. When inhaled, these compounds effectively relax the muscles and mind, helping to loosen the uterine muscles and reduce the intensity of pain. In addition, rose aromatherapy is also known to have antidepressant properties that calm the mind and help reduce anxiety (Manaf et al., 2020; Ajiningwulan et al., 2025)

When inhaled, aromatherapy molecules attach to the fine hairs in the nose and are immediately transmitted to the limbic system. This transmission triggers an emotional response that is sent to the brain. The message received is then converted into electrochemical compounds, producing a calming and relaxing effect. This process can also improve blood circulation, which ultimately helps reduce feelings of anxiety (Hamidah et al., 2022; Manaf et al., 2020)

This research is important because anxiety during the first stage of labor can significantly impact both maternal and neonatal outcomes, often leading to increased pain perception, prolonged labor, and higher rates of medical interventions. As natural and non-pharmacological methods for anxiety management are increasingly sought after in maternity care, rose aromatherapy offers a safe, accessible, and cost-effective complementary approach. Investigating its effectiveness provides evidence-based support for integrating holistic practices into routine labor care, ultimately promoting a more positive childbirth experience while reducing reliance on pharmaceutical interventions (Kartaatmaja et al., 2025).

METHOD

This study employed a quasi-experimental design using a non-equivalent control group method to examine the effects of rose aromatherapy on labor anxiety levels among pregnant women. The independent variable was the administration of rose aromatherapy, while the dependent variable was the level of labor anxiety measured using the Depression, Anxiety, and Stress Scale (DASS-21). The population consisted of all mothers undergoing regular deliveries during the active phase of labor in selected health centers. A total of 60 individuals constituted the population, from which a sample of 30 participants was selected and divided equally into an experimental group and a control group, with 15 participants in each group.

The sampling technique utilized in this study was non-probability sampling, specifically purposive sampling, based on predetermined inclusion and exclusion criteria. Participants in the experimental group were exposed to rose aromatherapy during the active phase of labor, while the control group received standard care without aromatherapy intervention. The research was conducted at two primary healthcare facilities: the Gurah Community Health Center and the Sambi Community Health Center, both located in Kediri Regency. Data collection took place over four months, from March to June 2023, ensuring observations were conducted under consistent clinical conditions.

To assess the impact of the intervention, the DASS-21 questionnaire was administered before and after the aromatherapy session in both groups to measure changes in anxiety levels. The Wilcoxon Matched-Pairs Signed Rank Test was used for statistical analysis to determine whether there was a significant difference in anxiety scores within and between groups. The significance level was set at an alpha value of 0.05, indicating that results with a p-value less than 0.05 were considered statistically significant. This non-parametric test was chosen due to the small sample size and the ordinal nature of the anxiety score data.

Ethical approval for the study was obtained from the Health Research Ethics Committee of the Malang State Health Polytechnics, ensuring that all procedures adhered to ethical standards for research involving human subjects. Informed consent was obtained from all participants prior to their involvement in the study, and confidentiality of data was strictly maintained. The findings of this research contribute to the growing body of evidence supporting complementary therapies in maternal care, particularly in managing labor-related anxiety in a natural and non-invasive manner.

RESULT

The study was conducted from March 14 to June 23, 2023, with a sample of 30 pregnant women. Data collection was conducted by measuring anxiety levels using the DASS-21 instrument in both the intervention and control groups.

RESULT

General Characteristics of Respondents in the Intervention Group

Table 1. General Characteristics of Respondents in the Intervention Group

No	General Characteristics	Variables	Frequency	Percentage
1	Age	20–35 years	13	87%
		>35 years	2	13%
2	Gestational Age	38 weeks	6	40%
		39 weeks	9	60%
3	Parity	1 time	6	40%
		More than 1	9	60%
4	Education	Elementary School	0	0%
		Junior High School	8	53%
		Senior High School	6	40%
		University	1	7%

Table 1 shows that the 30 samples of mothers in labor in the control group had a relatively homogeneous distribution of characteristics. Most respondents fell within the productive age range (20-35 years), comprising 13 individuals (87%), while those over 35 years of age accounted for only 2%. In terms of gestational age, most respondents (73%) had reached 39 weeks, and the remaining 27% were at 38 weeks. Most respondents were also mothers who had given birth more than once (multigravida), namely 10 people (67%), while 33% were first-time mothers. Finally, educational background was dominated by junior high school graduates (60%), followed by senior high school graduates (33%), and only 7% of respondents had a college education.

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Respondents' anxiety levels during phase I of the active phase

Table 2. Frequency Distribution of Anxiety Levels During the First Stage of the Active Phase of the Intervention Group

No	Anxiety Level	Frequency	Percentage
1	Normal	0	0
2	Mild	5	33%
3	Moderate	10	67%
4	Severe	0	0
5	Very Severe	0	0
	Total	15	100%

According to Table 2, the results of the frequency distribution analysis show that most respondents in the intervention group experienced a moderate level of anxiety, with a total of 10 respondents (67%). The remaining five respondents (33%) had a mild level of anxiety when entering the first stage of active labor.

Table 3. Frequency Distribution of Anxiety Levels During the First Stage of the Active Phase in the Control Group

No	Anxiety Level	Frequency	Percentage
1	Normal	0	0
2	Mild	0	0
3	Moderate	0	0
4	Severe	15	100%
5	Very Severe	0	0
	Total	15	100%

The results from Table 3 show that all respondents (100%) in the control group experienced a severe level of anxiety when entering the first stage of active labor, with a total of 15 respondents.

Anxiety Levels of Respondents During the First Stage of Active Labor

Table 4. Analysis Results of Anxiety Levels During the First Stage of Active Labor in the Intervention and Control Groups

No	Anxiety Level	Intervention Group	Control Group	Asymp. Sig (2-tailed)
1	Normal	0	0	
2	Mild	5	0	
3	Moderate	10	0	0.000
4	Severe	0	15	
5	Very Severe	0	0	
	Total	15	15	

Based on the Mann-Whitney test conducted using SPSS Table 5, there was a significant difference in anxiety levels among respondents during the first stage of active labor between the intervention and control groups. This test compared the significance value (Asymp. Sig. (2-tailed) or p-value) with the significance level ($\alpha = 0.05$). The obtained p-value was 0.000. Since the p-value (0.000) is smaller than α (0.05), it can be concluded that there is a significant difference in anxiety levels between the two groups.

DISCUSSION

Anxiety Levels of Respondents During the First Stage of Active Labor in the Intervention and Control Groups

The results of the study show a striking difference in the level of anxiety experienced by respondents when entering the active phase of the first stage of labor. In the control group, all respondents (100% or 15 people) experienced severe anxiety levels. Meanwhile, anxiety levels in the intervention group tended to be milder, with most respondents (67% or 10 people) experiencing moderate anxiety levels, and the rest (33% or five people) experiencing mild anxiety.

Anxiety in pregnant women is a common emotional reaction, characterized by excessive fear and discomfort when facing a series of physical and psychological changes during the labor process (Nath et al., 2019; Kalok et al., 2025). Although childbirth is a physiological phenomenon, this process is often associated with the potential for pain, bleeding, fear, and even the risk of death for both the mother and baby (Amanuel et al., 2021).

One of the main factors that influences anxiety levels, apart from family support, age, and parity, is education (Nugraha & Nataningtyas, 2024). Education level has an inverse relationship with anxiety; the higher the mother's education level, the better her knowledge and preparation, which can ultimately reduce anxiety levels (Çankaya & Şimşek, 2021). This is relevant considering that the educational background of the respondents in this study was dominated by junior high school graduates (Intervention Group 53%; Control Group 60%), which indicates vulnerability to anxiety due to a lack of preparation or knowledge.

Overall, these findings are in line with previous studies Delagneau et al., which confirm that mothers in labor will experience varying levels of anxiety, especially during the active phase of labor, and that educational factors are important contributors to the emergence of discomfort and excessive fear (Delagneau et al., 2023).

The Effect of Rose Aromatherapy on Anxiety Levels Among Respondents in the First Stage of Active Labor

The Mann-Whitney test was used to analyze data on respondents' anxiety levels during active phase I of labor. This test aimed to determine whether there was a difference in anxiety levels between the intervention group and the control group. The results of the analysis show that the Asymp. Sig (2-tailed) or P-value is 0.000. Because this value is less than the significance value α (0.05), namely (0.000 < 0.05), it is concluded that there is a significant difference in anxiety levels between respondents who received the intervention and respondents in the control group.

Anxiety is a condition of excessive and prolonged fear and discomfort, especially when preparing for childbirth. Anxiety or fear during childbirth can have physiological effects. These feelings trigger an increase in adrenaline levels, which in turn causes the cervix to stiffen. As a result, the labor process can slow down, and the intensity of the pain felt increases or becomes stronger. This anxiety is often caused by psychosocial factors, namely, environmental influences that can trigger or cause feelings of discomfort when a person faces specific situations, such as the process of giving birth (Steine et al., 2020).

Anxiety during childbirth is a condition characterized by the emergence of excessive fear and discomfort over a long period of time, often triggered by psychosocial factors from the environment (Kazemi et al., 2023). Physiologically, anxiety and fear during childbirth can increase adrenaline levels, resulting in cervical stiffness, slowed labor, and increased pain intensity. In an effort to treat this anxiety non-pharmacologically, the study used rose aromatherapy intervention. Aromatherapy, a complementary therapy that utilizes essential oils, is recognized for its benefits in aiding uterine

contractions, as well as its effectiveness in reducing tension and anxiety, while enhancing emotional well-being (Steine et al., 2020).

Based on the results of the Mann-Whitney statistical test in this study, a P-value of 0.000 was obtained, indicating a statistically significant difference in anxiety levels between the group that received aromatherapy intervention and the control group. One type of aromatherapy that has been proven effective in reducing anxiety is rose aromatherapy. Its effectiveness lies in its ability to influence the central nervous system, which is the area responsible for memory and emotions. In addition to acting as an anti-anxiety agent due to its chemical content, including finitil alcohol, geraniol, and linalool (Chen & Viljoen, 2022). Rose aromatherapy also provides important physiological benefits during childbirth. These benefits include enhanced uterine function, improved blood circulation, and a calming overall effect.

When aromatherapy is inhaled, its molecules attach to receptors in the nasal hair and are then transmitted to the limbic system in the brain. This process triggers an emotional response that is conveyed to the brain. Once received, the message is converted into an electrochemical compound that produces a calming and relaxing effect. This effect can further enhance blood circulation, which contributes overall to reduced feelings of anxiety (Fung et al., 2021; Men et al., 2025).

The results of this study align with the findings of a 2022 study conducted by Ester Simanullang, Linda, and Kamelia Sinaga. The previous study also reported a significant difference in anxiety levels between the intervention group and the control group among women in the first stage of labor. The similarity of these findings further strengthens the conclusion that rose aromatherapy reduces anxiety levels in women in the first stage of labor (Hamdamian et al., 2018)

The findings of this study are supported by the results of a 2020 study conducted by Mahbubeh Tabatabaelchehr and Hamed Mortazavi. They concluded that aromatherapy is effective as a complementary and alternative modality for relieving anxiety (Tabatabaeichehr & Mortazavi, 2020). The findings in this study are further supported by a study conducted by Ghiasi et al. (2019). Their study recommends that aromatherapy can be applied as an effective complementary therapy to help reduce anxiety experienced during labor (Ghiasi et al., 2019).

Based on existing theory and the results of this study, it can be concluded that rose aromatherapy administered to the intervention group effectively reduced their anxiety levels. This study also confirmed that there was a difference in anxiety levels between the intervention group and the control group. This anxiety-reducing effect occurred because rose aromatherapy can stimulate the central nervous system, which is the center of emotional regulation, thereby triggering a relaxing effect.

CONCLUSION

It was found that before the intervention, most respondents in the intervention group experienced moderate levels of anxiety. In contrast, all respondents in the control group experienced severe levels of anxiety during the first stage of active labor. This indicates that both groups initially had varying levels of anxiety prior to receiving any treatment or intervention. Furthermore, the study revealed a significant effect of rose aromatherapy in reducing anxiety levels among respondents during the active phase of labor. The intervention group showed a noticeable decrease in anxiety compared to the control group, as supported by the statistical test results. These findings suggest that rose aromatherapy can serve as an effective non-pharmacological method to help mothers manage anxiety during labor.

Rose aromatherapy is recommended for mothers in labor as a relaxation technique to help reduce anxiety during the active phase of the first stage of labor. For educational institutions and

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researchers, this study serves as a valuable reference for further exploration and development of knowledge on the effects of rose aromatherapy on maternal anxiety. Meanwhile, healthcare professionals are encouraged to consider rose aromatherapy as an effective, non-pharmacological alternative to help manage anxiety in mothers during labor.

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CONFLICT OF INTEREST

There is no conflict of interest in this article.

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