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The Effect of Rosa Damascena Aromatherapy on the Level of Anxiety During the First Active Phase of Labor

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ABSTRACT

Anxiety during labor is a common emotional response that can interfere with the natural progress of childbirth. Increased stress hormones, such as adrenaline, may reduce uterine contractions and prolong labor. Aromatherapy has the potential to promote relaxation, improve mood, and calm the mind. Rose essential oil, in particular, has been shown to reduce sympathetic nerve activity and lower plasma adrenaline levels. This study aimed to examine the effect of aromatherapy on maternal anxiety during the active phase of the first stage of labor. A quasi-experimental design with a one-group pre-test-post-test and control group was used. A total of 20 laboring mothers at Lena Barus Binjai Clinic (October–December 2024) were divided into intervention (n = 10) and control (n = 10) groups. The t-test results showed a significant effect of *Rosa damascena* aromatherapy in reducing anxiety, with a p-value of 0.000 (<0.05). The mean ranks for the control and intervention groups were 5.70 and 15.30, respectively, with total ranks of 57.00 and 153.00. *Rosa damascena* aromatherapy is effective in reducing anxiety during the first stage of active labor.

Keywords: Aromatherapy, *Rosa damascena*, Anxiety, Maternity

INTRODUCTION

Maternal mortality remains a significant health concern in Indonesia. According to records from the Ministry of Health's Nutrition and Maternal and Child Health Program, the number of maternal deaths has generally increased each year but showed a decline in 2022, with 3,572 deaths reported, compared to 7,389 in 2021. The leading causes of maternal death in 2022 were hypertension in pregnancy (801 cases), postpartum hemorrhage (741 cases), heart disease (232 cases), and various other causes (1,504 cases). The highest percentage of maternal deaths occurred during childbirth (39%), followed by the postpartum period (31%) and pregnancy (30%) (Ministry of Health, Republic of Indonesia, 2023).

Childbirth is defined as the process of expelling viable products of conception from the uterus to the outside world (Prawirohardjo, 2009). One of the factors influencing the success of labor is maternal effort or labor power, which includes uterine contractions, abdominal muscle effort,

diaphragmatic contractions, and the support of surrounding ligaments (Mochtar, 1998). However, anxiety during labor can increase adrenaline (epinephrine) production, which inhibits uterine activity and may lead to prolonged labor (Fraser & Cooper, 2020). Prolonged labor poses serious risks, including intrapartum infection, uterine rupture, and injury to the pelvic floor muscles—conditions that can contribute to maternal mortality (Prawirohardjo, 2009).

Globally, anxiety during pregnancy and labor is a widely reported issue. The World Health Organization (2019) stated that more than 12 million pregnant women worldwide experienced complications during the third trimester, with approximately 30% experiencing anxiety during labor. In the United Kingdom, 81% of pregnant women reported mental health problems during pregnancy. In France, among primigravida mothers, 7.9% experienced anxiety, 11.8% suffered from depression, and 13.2% had both anxiety and depression (Hasim, Rizqika, & Pradewi, 2019).

Based on research by Oktaviani and Nugraheny (2019), anxiety during labor has been linked to complications such as prolonged labor, especially during the first and second stages. The intensity of anxiety often varies with parity, with first-time mothers generally experiencing higher levels of anxiety compared to multiparous women. Another study found that many pregnant women report varying degrees of anxiety before childbirth, ranging from mild to severe. These findings emphasize the need to address maternal anxiety to improve the quality and safety of labor.

When a woman experiences anxiety or stress, signals are transmitted through the hypothalamic-pituitary-adrenal (HPA) axis, resulting in the release of several stress hormones, including adrenocorticotropic hormone (ACTH), cortisol, catecholamines, endorphins, growth hormone, prolactin, and gonadotropins (FSH/LH). These hormones cause systemic vasoconstriction, including uteroplacental vasoconstriction, which impairs blood flow to the uterus and decreases oxygen supply to the myometrium. This results in weaker uterine contractions and can prolong labor. Elevated catecholamines may also reduce the immune response of both mother and fetus (Martini & Oktaviani, 2015).

Aromatherapy has emerged as a promising complementary therapy to reduce maternal anxiety during labor. Essential oils, known as volatile plant extracts, have been used in aromatherapy for their therapeutic effects. *Rosa damascena* (red rose) contains active compounds such as muurolene, isomenthone, linalool, α-pinene, geraniol, and phenethyl alcohol, which have

relaxing and mood-stabilizing properties. Rose petals also contain linalool (3.71%), known for its sedative effect. *Rosa damascena* oil is effective in soothing emotional tension, alleviating depression, and promoting better sleep. Inhalation of rose oil can reduce sympathetic nerve activity by 40% and lower plasma adrenaline concentrations (Hongratanaworakit, 2009). Among the safest and most effective methods of application is diffusion through a lamp or room spray.

Recent findings support the use of essential oils as a non-pharmacological intervention during childbirth. A meta-analysis by Li et al. (2021) demonstrated that aromatherapy significantly reduced anxiety and pain levels among laboring women. This aligns with global efforts to integrate holistic approaches into maternal care, emphasizing the emotional well-being of mothers as a crucial factor in achieving safe and positive birth outcomes.

Observations conducted over two weeks at a local clinic revealed that several laboring mothers displayed signs of anxiety, such as tense facial expressions, repetitive questioning, screaming during contractions, fear of childbirth, and poor pushing efforts. These observations highlight the real and immediate impact of anxiety on labor performance. While previous studies have explored the general benefits of aromatherapy during labor, there is limited empirical evidence specifically focusing on the effects of *Rosa damascena* on maternal anxiety during the active phase of the first stage of labor. This study, therefore, offers a novel contribution by examining the targeted use of *Rosa damascena* essential oil as a natural intervention to reduce anxiety at this critical stage, potentially improving maternal comfort and labor outcomes in clinical practice.

METHOD

The type of research is quasi-experimental, with the research design used being a one-*group pretest-posttest with control design.* The population was sampled, namely 20 mothers who gave birth at the Lena Barus Binjai Clinic from October to December 2024, who were then divided into 2 groups, namely 10 intervention groups and 10 control groups. The inclusion criteria for giving birth at the Lena Barus Binjai clinic, active phase I stage, include being in a conscious condition and able to communicate, and willing to be respondents. The research flow before treatment was carried out with informed consent and ethical testing No.078/KEPK/UNPRI/10/2023. Rose essential oil (*Rosa damascena*), as much as 5 drops, mixed with 150 ml of water, into a diffuser (Young Living). Aromatherapy was given for 1 hour. The Hamilton Anxiety Rating Scale (HARS) was used to measure the level of anxiety

with categories of no anxiety (<14), mild anxiety (14-20), moderate anxiety (21-27), severe anxiety (> 27). Data analysis using the Independent Sample t-Test statistical test.

RESULTS

Univariate Analysis

Table 1. Frequency Distribution of Respondent Characteristics at Lena Barus Clinic Medan

Control Group			Intervention Group		
Age	**n**	**%**	**Age**	**n**	**%**
< 25 Years	2	20	< 25 Years	3	30
25-35 years	5	50	25-35 years	4	40
> 35 Years	3	30	> 35 Years	3	30
Work	**n**	**%**	**Work**	**n**	**%**
Housewife	5	50	Housewife	3	30
Self-employed	2	20	Self-employed	5	50
Civil servant	3	30	civil servant	2	20
Parity	**n**	**%**	**Parity**	**n**	**%**
Nulliparous	2	20	Nulliparous	5	50
Primipara	6	60	Primipara	3	30
Multipara	2	20	Multipara	2	20
Grand multipara	0	0	Grand multipara	0	0
Total	**10**	**100**	**Total**	**10**	**100**

Based on the table, in the control group, the majority of the age group 25-35 years were 5 people (50%) and the minority of the age group <25 years were 2 people (20%), for the majority of unemployed (housewives) were 5 people (50%) and the minority of self-employed were 2 people (20%). In the intervention group, the majority of the age group 25-35 years were 4 people (40%), the age group <25 years and >35 years with the same number of 3 people (30%), the majority of self-employed were 5 people (50%) and the minority of civil servants were 2 people (20%). The majority of nulliparous parity were 5 people (50%), and the minority of multiparous were 2 people (20%)

Table 2. Pre-test of Aroma Therapy on Anxiety Levels in the First Stage of Labor in the Active Phase

Pretest					
Control Group			**Intervention Group**		
Anxiety	**n**	**%**	**Anxiety**	**n**	**%**
Light	0	0	Light	0	0
Currently	8	80	Currently	9	90
Heavy	2	20	Heavy	1	10
Total	**10**	**100**	**Total**	**10**	**100**

Based on table 2, it is known that the pretest of aromatherapy on anxiety levels showed that the majority of the control group experienced moderate anxiety, as many as 8 (80%), and the intervention groupthe majority of moderate anxiety was 9 (90%) and the minority of severe anxiety was one person (10%).

Table 3. Posttest of Aroma Therapy on Anxiety Levels During the First Stage of Labor in the Active Phase

Posttest					
Control Group			**Intervention Group**		
Anxiety	**n**	**%**	**Anxiety**	**n**	**%**
Light	0	0	Light	8	80
Currently	8	80	Currently	2	20
Heavy	2	20	Heavy	0	0
Total	**10**	**100**	**Total**	**10**	**100**

Based on Table 3, it is known that the post-test of aromatherapy on anxiety levels in the control group mostly experienced moderate anxiety many as 8 people (80%), and the intervention groupmajority mild anxiety many as 8 people (80%), and a minority of moderate anxiety, as much as 2 people (20%).

Bivariate Data Analysis

The results of the normality test of the control group and the intervention group using Shapiro-

Wilk obtained p values of 0.674 and 0.876, which means that the data are normally distributed. Based on the results of the normality test, data analysis was carried out using the Paired Samples t-Test, to see the effect of Rosa damasecana aroma therapy on reducing maternal anxiety during childbirth at the Lena Barus Binjai Clinic in 2023, can be seen in the table below:

Table 4. The Effect of Rosa Damascena Aroma Therapy on Anxiety Levels During the First Stage of Labor Active Phase

Variables	Group	Means	Standard Deviation	p value
Anxiety (Control)	*Pre-test*	8,050	0.103	0.555
	Post-test	8,070		
Anxiety (Intervention)	*Pre-test*	8,220	0.271	0,000
	Post-test	8,990		

Based on Table 4, the means of the pre-test intervention group are (8.220), while the means of the post-test are (8.990). The results of the statistical test, t-Test p value obtained a value of 0.000 < 0.05, which means there is an influence. The administration of Rosa damascena aroma therapy on the level of anxiety during the first active phase of labor.

Table 5. Differences Between the Control Group and the Intervention Group of Rosa Damasecana Aroma TherapyAnxiety Levels During the First Stage of Labor, Active Phase

Mann Whitney			
	Mean Rank	Sum of Ranks	p value
Control Group	5.70	57.00	0,000
Intervention Group	15.30	153.00	

Based on Table 5 above, it is known that the control group and the intervention group have mean ranks of 5.70 and 15.30, respectively, and a sum of ranks of 57.00 and 153.00. Based on the p-value, the value obtained is 0.000 <0.05, which means there is a difference between the control group and the intervention group.

DISCUSSION

Anxiety is an unpleasant emotional state characterized by subjective fear, physical discomfort, and physiological symptoms (Katona, 2012). Psychological responses such as anxiety and fear trigger an increase in catecholamine and adrenaline levels, resulting in vasoconstriction, reduced blood flow, and decreased oxygenation to the uterine muscles. This constriction increases labor pain and may prolong the labor process.

Rosa damascena (rose) contains several active compounds such as phenethyl alcohol, citronellol, nonadecane, geraniol, nerol, ethanol, heneicosane, and kaempferol. These compounds contribute to the therapeutic properties of rose essential oil, which is widely used in herbal medicine due to its relaxing, analgesic, antitussive, hypnotic, antioxidant, antibacterial, anti-inflammatory, antidepressant, and antidiabetic effects. The aroma of rose is known to stimulate the central nervous system and has been reported to support cervical dilation, ligament relaxation, improved uterine function, and increased blood circulation, serving as a sedative during labor. Previous studies have shown that the use of rose essence significantly reduces labor pain and maternal anxiety (Fatimah & Sundari, 2020).

In this study, a pre-test showed that the majority of the control group experienced moderate anxiety, while the intervention group also had a majority with moderate anxiety levels, and one participant experienced severe anxiety. Following the intervention using 5 drops of *Rosa damascena* essential oil mixed with 150 ml of water via a diffuser (Young Living) for 1 hour, the control group remained mostly at a moderate anxiety level (80%), whereas the intervention group showed improvement, with 80% experiencing mild anxiety and 20% experiencing moderate anxiety. Furthermore, within the intervention group, severe anxiety was predominantly observed among nulliparous women, and moderate anxiety was mostly seen in primiparous women.

Aromatherapy inhalation is considered safe, quick, and convenient, and is commonly administered via devices such as vaporizers or diffusers. The olfactory nerve, the only cranial nerve directly exposed to external stimuli, sends signals to the cerebral cortex, producing a strong neurological response. When essential oil vapors come into contact with the olfactory mucosa, they activate the limbic system and hypothalamus, stimulating the production of neurotransmitters such as dopamine and serotonin. This biochemical response leads to relaxation, sedation, and mood enhancement. Additionally, activation of the autonomic

nervous system through the limbic pathway helps reduce anxiety by promoting a state of calm (Lee, 2015).

The results of the t-test showed that the pre-test mean anxiety score in the intervention group indicated a statistically significant effect. The difference between the intervention and control groups was reflected in the mean rank scores: 15.30 in the intervention group and 5.70 in the control group, with rank sums of 153.00 and 57.00, respectively. This is consistent with the findings of Pratiwi et al. (2023), who reported that the use of oxytocin massage and aromatherapy significantly reduced postpartum anxiety levels among primiparous mothers. The intervention group had a greater decrease in anxiety levels compared to the control group, with mean rank values indicating stronger effects from the combined intervention.

However, this finding contrasts with a study by Sri, Kurniyati, and Eva (2022), which assessed the effectiveness of combining diaphragmatic breathing exercises with rose aromatherapy to reduce anxiety in primigravida mothers. Using a quasi-experimental design, the study showed no significant difference in anxiety scores between the intervention group and the control group using rose aromatherapy alone. This discrepancy suggests that the method of delivery and duration of intervention may play a critical role in the effectiveness of aromatherapy.

CONCLUSION

The results of the t-test statistical test showed a p value of 0.000 < 0.05, which means that *Rosa damascena* aromatherapy significantly reduced maternal anxiety levels during the active phase of first-stage labor. The intervention group showed a significant decrease compared to the control group. These findings support the use of aromatherapy as an alternative non-pharmacological method in obstetric services, especially during the labor process.

REFERENCES

Fatimah, M., & Sundari, S. W. (2020). Aromatherapy untuk mengurangi nyeri persalinan. In *Prosiding Konferensi Nasional Kesehatan: Stunting dan 8000 Hari Pertama Kehidupan* (Mataram, 04 Maret 2020, Golden Palace Hotel).

Fraser, D. M., & Cooper, M. A. (2020). *Myles' textbook for midwives* (17th ed.). Elsevier.

Fung, T. K. H., Lau, B. W. M., Ngai, S. P. C., & Tsang, H. W. H. (2021). Therapeutic effects and mechanisms of essential oils in mood disorders: Interaction between the nervous

and respiratory systems. *International Journal of Molecular Sciences, 22*(9), 4844. https://doi.org/10.3390/ijms22094844

Hasim, Pradewi, R., & Sulastri. (2019). Gambaran kecemasan ibu hamil [Undergraduate thesis, Universitas Muhammadiyah Surakarta]. UMS Repository. http://eprints.ums.ac.id/63124/

Hermayati, S., Kurniyati, & Susanti, E. (2022). Efektivitas diaphragm breathing exercise kombinasi aromaterapi mawar terhadap skor kecemasan menjelang persalinan pada ibu hamil primigravida di wilayah kerja Puskesmas Durian Depun tahun 2022. *Journal of Midwifery, 10*(2), 55–64. https://doi.org/10.37676/jm.v10i2.3253

Hongratanaworakit, T. (2009). Relaxing effect of rose oil on humans. *Natural Product Communications, 4*(2), 291–296. https://doi.org/10.1177/1934578X0900400226

Katona, C. (2012). *Psychiatric disorders in pregnancy and the puerperium*. Routledge.

Kementerian Kesehatan Republik Indonesia. (2023). *Profil kesehatan Indonesia 2022*. Kementerian Kesehatan RI.

Lee, I. (2015). Effects of inhalation of relaxing essential oils on electroencephalogram activity. *International Journal of New Technology and Research, 2*(5), 263–266. https://www.neliti.com/publications/263522

Martini, & Oktaviani, I. (2015). Hubungan karakteristik ibu hamil trimester III dengan kecemasan ibu menghadapi persalinan di Metro. *Jurnal Kesehatan Metro Sai Wawai, 9*(1), 1–6. http://www.ejurnal.poltekkes-tjk.ac.id/index.php/JKM/article/view/1752

Mochtar, R. (1998). *Sinopsis obstetri: Obstetri fisiologi, obstetri patologi* (2nd ed.). EGC.

Oktaviani, E., & Nugraheny, E. (2019). Dampak kecemasan pada ibu terhadap proses persalinan. *Jurnal Ilmu Kebidanan (Journal of Midwifery Sciences), 6*(1), 16–22. http://jurnalilmukebidanan.akbiduk.ac.id/index.php/jik/article/view/110

Pratiwi, D. M., Juniarto, A. Z., & Rejeki, S. (2023). Effect of oxytocin massage and aromatherapy on reducing anxiety among primipara postpartum. *Jurnal Ilmu Keperawatan Maternitas PPNI, 6*(1), 33–42. https://doi.org/10.32584/jikm.v56i1.2002

Prawirohardjo, S. (2009). *Buku acuan nasional pelayanan kesehatan maternal dan neonatal* (4th ed.). Yayasan Bina Pustaka Sarwono Prawirohardjo.

World Health Organization. (2019). *Maternal mental health*. https://www.who.int/news-room/fact-sheets/detail/mental-health-in-pregnancy

Zamriati, W. O., Hutagaol, E., & Wowiling, F. (2019). Faktor-faktor yang berhubungan dengan kecemasan ibu hamil menjelang persalinan di Poli KIA PKM Tuminting. *Jurnal Keperawatan UNSRAT, 1*(1), 1–7.
https://ejournal.unsrat.ac.id/index.php/jk/article/view/23939