Aromatherapy as a Non-Pharmacological Approach to Pain Management in The Active Phase of The First Stage of Labor

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Abstract: Birth pain is a physiological condition that can cause stress, anxiety, and tension that result from childbirth, even increasing the risk of complications. This condition can cause severe labor during childbirth, which causes muscular contractions, uteroplacental circulation, vascular circulation, and cervical oxygen, causing uterine ischemia to increase the amount of pain and risk complications during labor. Attempts to reduce the pain of childbirth involve two methods of pain control: pharmacological and non-pharmacological. One attempt to reduce the pain of childbirth by non-pharmacological care could be made by inhaling an aromatic orphanage with a diffuser at the time of childbirth. The study aims to examine the effect of aromatherapy on the intensity of labor pain in the Ciamis flood district in 2025. The study employed a quasi-experimental design with a one-group pretest-posttest approach. The sampling technique used is impressive, employing the Lameshow formula with 45 respondents. The study indicates that there was an average difference in the scale of childbirth pain before and after the lavender aroma was given to mothers in childbirth in the flooded hospital. Thus, aromatherapy can be an effective alternative to non-pharmacological intervention in birth pain management.

Keywords: Childbirth, Aromatherapy, Labor Pain

INTRODUCTION

Childbirth is something every pregnant woman eagerly anticipates, experiencing it and feeling joy. It can be incredibly joyful, welcoming the child she has carried for nine months. Labor is a physiological process that women experience at the end of their pregnancy. This process begins with labor contractions, marked by changes in the cervix, and ends with the expulsion of the placenta (Ariyanti & Aulia, 2019).

The labor process begins with uterine contractions, which cause pain and discomfort for the mother. Most women will experience pain during labor. Labor pain is individual; each individual will perceive pain differently in response to the same stimulus, depending on their pain threshold. Labor pain is a subjective experience of physical sensations associated with uterine contractions, dilation, cervical effacement, and fetal descent during labor (Darmawan et al., 2022).

This condition can cause severe pain during labor, leading to uterine muscle contractions, uteroplacental circulation, and decreased uterine blood flow and oxygenation. This condition can potentially lead to uterine ischemia, which increases pain and the risk of complications during labor (Noviyanti & Jasmi, 2022).

Untreated pain can increase the maternal mortality rate (MMR) and infant mortality rate (IMR), as pain increases the mother's breathing and heart rate, disrupting blood and oxygen flow to the placenta. Management and monitoring of labor pain, especially during the active phase of the first stage, is crucial, as it can determine whether a mother can have a normal delivery or require surgery due to complications caused by severe pain. Labor pain leads most mothers to seek the quickest and easiest way to relieve pain. The current trend is that many mothers opt for cesarean sections without clear indications, and also request epidural anesthesia. Increasingly, mothers are seeking pain-free births, leading to the adoption of various methods to reduce labor pain, including pharmacological and non-pharmacological techniques (Rambe, 2022).

According to the World Health Organization in 2019, cases of mothers with painful labor stated that only 10-15% of labor was painless. The data found that most mothers with painful labor were found, namely a prevalence of 85-90% of labor that occurred with pain. As many as 91.9% of women experienced pain during the first stage of labor. The results of this study showed that primiparas experienced a higher level of labor pain compared to multiparas, namely 2.63 times (95% CI 0.96-7.20) (Widiawati, 2020).

The Indonesian Hospital Association data center explains that 15% of mothers giving birth in Indonesia experience complications during labor, 21% of mothers experience severe pain, and 64% of mothers do not receive information about actions to take to reduce labor pain (Barat, 2023).

The number of maternal deaths in 2023 in Ciamis Regency was 21 cases, with a total of 16,210 live births. The causes of maternal deaths were hypertension during pregnancy, childbirth, and postpartum (9%), obstetric hemorrhage (10%), non-obstetric complications (10%), and other causes (71%). The 21 maternal deaths occurred in pregnant women (29%), women in labor (38%), and postpartum women (33%) (Ciamis, 2023).

Efforts to reduce pain during childbirth have been widely implemented. There are two methods of pain management: pharmacological and non-pharmacological. Non-pharmacological pain management is currently receiving significant attention due to its advantages over pharmacological methods. Several studies have also shown that non-pharmacological methods are superior in reducing pain due to their affordability, ease, non-invasiveness, increased confidence, and increased patient involvement in care (Pricilia Yunika et al., 2023).

Based on the description above, it is necessary to conduct research with the title " Aromatherapy as a Non-Pharmacological Approach to Pain Management in the Active Phase of First Stage of Labor in Ciamis."

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METHOD

This study uses a quantitative research design, specifically a quasi-experimental one-group pretest-posttest design. The study population consisted of all primigravida in-partu mothers in the first stage of the active phase of 4-6 cm dilation at the Banjarsari Health Center,

Banjarsari District, Ciamis Regency, during March-May 2025, with a sample of 45 respondents. The data used are primary. The instrument used in the study is the Numeric Rating Scale, ranging from 0 to 10. Respondents were given lavender aromatherapy, a type of essential oil, applied to an electric aroma diffuser, which was turned on in the intervention room for 10 minutes, with four drops mixed with clean water to the specified limit on the humidifier, when the mother was in labor. Furthermore, bivariate analysis was performed using a paired t-test.

RESULT AND DISCUSSION
Result
1. Univariate Analysis

Table 1: Descriptive statistics of the pain scale of the first stage of labor in the active phase before giving aromatherapy to mothers giving birth at the Banjarsari Community Health Center.

Variable	Mean	Min	Maks	SD	n
Pre-test pain scale	8.44	7	9	.624	45

Data pada table 1 menunjukkan skala nyeri persalinan sebelum penerapan pemberian aromaterapi lavender paling tinggi adalah skala 9.

Table 2: Descriptive statistics of the pain scale of the first stage of labor in the active phase after giving aromatherapy to mothers giving birth at the Banjarsari Community Health Center.

Variable	Mean	Min	Maks	SD	n
Post-test pain scale	4.18	3	5	.777	45

The data in Table 4.2 shows that the largest scale of labor pain after applying lavender aromatherapy was scale 5.

2. Bivariate Analysis
Prior to data analysis, the maternal pain scale data were tested for normality. This test used the Sapphiro-Wilk method, as the number of respondents was less than 50. The results of the normality test are shown in the following table:

Table 3 Normality Test

Variable	P value	Ket
Pre-test pain scale	0,054	Normality
Post-test pain scale	0,051	Normality

The data in Table 3 show the results of the Shapiro-Wilk normality test, which yielded a p-value> 0.05, indicating that the data are normally distributed. The standard deviation (SD) of mothers' knowledge before education was 0.608, while after education, it decreased to 0.137, indicating that the distribution of mothers' responses became more consistent and shifted toward a more correct understanding.

Table 4 Differences in the average scale of labor pain before and after giving aromatherapy to mothers giving birth at the Banjarsari Community Health Center.

Variabel	Mean	SD	P value	n
Pre-test pain scale	8.44	.624	0,000	45
Post-test pain scale	4.18	.777		

Table 4 shows the average labor pain scale before lavender aromatherapy (8.44, standard deviation = 0.624) and after the intervention (4.14, standard deviation = 0.777). The statistical test yielded a p-value of 0.000. This means there is a difference in the average labor pain scale

before and after aromatherapy administration among mothers giving birth at the Banjarsari Community Health Center.

Discussion
Pain scale of the first stage of labor in the active phase before giving aromatherapy to mothers giving birth at the Banjarsari Community Health Center.

The results of the study showed that the pain scale during the active phase of the first stage of labor before the intervention with lavender aromatherapy was 9 (controlled severe pain). Looking at these data, it can be seen that all respondents experienced pain, including controlled severe pain, although on a different scale. This indicates that every laboring mother in the first stage of labor, the active phase of the maximum dilation period, experienced pain perception caused by cervical changes and myometrial ischemia in the first stage of labor, the active phase. Labor pain is a subjective experience of physical sensations associated with uterine contractions, cervical dilation and thinning, and fetal descent during labor. Physiological responses to pain include increased blood pressure, pulse rate, respiration rate, sweating, pupil dilation, and muscle tension. This pain, if not managed properly, can increase feelings of worry, tension, fear, and stress, ultimately prolonging labor (Yulizawati et al., 2019).

The results of this study are consistent with research conducted at the Nur Faizha Inpatient Primary Clinic, South Kotabumi District, North Lampung Regency, in 2019, which found that the average pain level among mothers giving birth, measured before aromatherapy was administered, was 4.89 with a standard deviation of 1.396. Labor pain will increase in intensity with increasing dilation. The peak of uterine pain continues to increase until complete dilation. This is due to myometrial anoxia, in which muscle contractions occur during a period of relative anoxia, causing pain (Sari & Riona, 2020). According to the researcher's analysis, the pain experienced by the mother at the end of the first stage of labor is caused by stretching of the perineum and vulva, cervical uterine pressure during contractions, progressive pressure from the lowest part of the fetus on the lumbosacral plexus, bladder, intestines and other sensitive pelvic structures. Somatic pain in labor occurs from connective tissue, muscles, bones, and skin and is often described as severe pain that has a clear and easily identifiable origin.

Pain scale of the first stage of labor in the active phase after giving aromatherapy to mothers giving birth at the Banjarsari Community Health Center.

The research results showed that the highest pain scale for labor after lavender aromatherapy was 5 (moderate pain). The data showed that respondents' pain scale scores had begun to decrease, though at varying intensities. The varying changes or decreases in pain among respondents indicate different pain perceptions. Changes in labor pain levels occurred as the cervix dilated, or the cervical dilation period widened. This indicates that labor pain began in the first stage, the latent phase, and continued into the active phase (4-9 cm dilation). Mothers felt pain originating from the lower abdomen and spreading to the lumbar region of the back and down to the thighs. Mothers usually experienced pain only during contractions and were pain-free in the intervals between contractions (Bloom & Reenen, 2021).

Increased uterine contractions also cause the pain that occurs during the active phase of the first stage to achieve full cervical dilation. As the frequency of uterine contractions increases, the pain intensifies, and it continues to increase as the dilation increases. This is caused by myometrial anoxia, in which muscle contractions during periods of relative anoxia trigger pain. If uterine relaxation between contractions is insufficient to allow adequate oxygenation, the pain becomes more severe. The results of this study align with research conducted at the Nur Faizha Inpatient Primary Clinic in South Kotabumi District, North

Lampung Regency, in 2019, which found that the average pain level in laboring mothers, measured two seconds after aromatherapy, was 3.52 with a standard deviation of 0.975. This decrease may be due to the lavender aromatherapy intervention (Sari & Riona, 2020).

According to the researchers' analysis, the decrease in pain levels in the active phase of the first stage of labor occurred after the lavender aromatherapy intervention, which had a positive effect on pain management. This is based on field findings, where respondents reported pain with varying degrees of reduction.

Differences in the average scale of labor pain before and after giving aromatherapy to mothers giving birth at the Banjarsari Community Health Center.

The results of the study showed an average labor pain scale of 8.44 before lavender aromatherapy, which decreased to 4.14 after the intervention. Looking at the data, there was an average decrease of around 4.2. Thus, lavender aromatherapy is effective in reducing labor pain. This is supported by the statistical test, which yielded a p-value of 0.000, indicating a difference in the average labor pain scale before and after lavender aromatherapy administration among mothers giving birth at the Banjarsari Health Center. The existence of this influence is inseparable from the administration of lavender intervention, which has many benefits, namely as an infection preventative, showing effects as an antiseptic, antibiotic and anti-fungal. Lavender aromatherapy can increase alpha waves in the brain, helping create a relaxed state. Lavender essential oil can reduce anxiety. Lavender can provide calm, balance, a sense of comfort, openness, and confidence (Sagita & Martina, 2019). In lavender aromatherapy, compared to other aromatherapies, it has advantages in terms of anxiety and pain. A study conducted by a national institute in Japan found that the linalool compound in lavender oil has anti-anxiety and anti-pain effects (Yang et al., 2019).

The results of this study align with research that found the use of aromatherapy during labor to affect maternal pain levels, with a p-value of 0.000. This study is expected to encourage healthcare professionals to manage labor pain using non-pharmacological methods, such as inhalation techniques. The vapor produced by an aromatherapy diffuser stimulates airborne essential oil particles, which then travel through the olfactory bulb to the limbic system (the center of emotions, mental state, creativity, sexuality, and memory). This releases various neurochemicals that produce a variety of effects, such as reducing pain, promoting feelings of peace and tranquility, a sense of inner calm, and increasing physical and sexual arousal (Cruz et al., 2021). Furthermore, a 2019 study on the Effect of Lavender Aromatherapy on Labor Pain in North Lampung found that warm compresses and lavender aromatherapy significantly reduced pain levels in primigravida laborers during the active phase (p-value = 0.000). The results of this study are expected to encourage healthcare workers to manage labor pain using non-pharmacological methods, including warm compresses and lavender aromatherapy, so that laboring mothers can feel calmer and more comfortable during the labor process.

Another study found that providing aromatherapy to first-stage laborers reduced pain intensity (Darmawan et al., 2022). Lavender aromatherapy is effective in reducing pain because lavender contains the compound linalool, which is found in lavender oil and exhibits anti-anxiety and analgesic effects (Yang et al., 2019). Compared to other aromatherapies, such as lemon aromatherapy, Afdila & Nuraida (2021) argue that its many benefits are lost because lemon oil evaporates quickly and depletes rapidly, thereby reducing its effectiveness. Another advantage of lavender aromatherapy is its aroma. Lavender oil has a sweet, floral, and herbal aroma, with a balsam-like aroma. Lavender aromatherapy can increase alpha brain waves, which help create a relaxed state. Lavender is also reported to have a sedative effect similar to antidepressants, so that it can be used in the treatment of tremors and epilepsy. The superior anxiolytic and antidepressant effects make lavender aromatherapy effective for reducing labor pain up to the second stage (Supiani et al., 2024). Based on the description above, researchers

believe that mothers who are about to give birth can adapt to pain after being given lavender aromatherapy. If the mother is unable to adapt, it will result in anxiety and physical weakness due to an excessive response to the pain felt.

CONCLUSION

Based on the results of research on the effect of aromatherapy on the intensity of labor pain in the first active phase at the Banjarsari Community Health Center, Banjarsari District, Ciamis Regency, in 2025, the following conclusions can be drawn: the average labor pain scale before the administration of lavender aromatherapy is 8.44. The average pain score after lavender aromatherapy is 4.14. There is a difference in the average labor pain scale before and after administration of lavender aromatherapy on reducing the intensity of labor pain in the first active phase, the results of statistical tests reinforce this obtained p value 0.000, meaning there is a difference in the average labor pain scale before and after administration of aromatherapy in mothers giving birth at the Banjarsari Community Health Center.

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