JUKEKE Jurnal Kesehatan dan Kedokteran
OPEN ACCESS
JUKEKE Vol 4 No. 2 | Juni 2025 | ISSN: 2829-0437 (print), ISSN: 2829-050X (online), Page 176-185

Effectiveness of Essential Oil Aromatherapy in Reducing Labor Pain Among Women Giving Birth at Zhafira Zharifa Clinic

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Article History
Received : May 02, 2025
Revised : May 19, 2025
Accepted : May 25, 2025
Publication : May 28, 2025

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Cite This Article:
Anggraeni, R. D. ., Fitriani, D. R., Rahma, M., Ronika, M. B. H., & Istari, I. (2025). Effectiveness of Essential Oil Aromatherapy in Reducing Labor Pain Among Women Giving Birth at Zhafira Zharifa Clinic. *Jurnal Kesehatan Dan Kedokteran*, *4*(2), 176–185.

DOI:
https://doi.org/10.56127/jukeke.v4i2.2766

Abstract: Labor pain is a natural component of childbirth; however, excessive pain may negatively affect maternal physical and psychological well-being. Effective pain management is therefore essential to improve maternal comfort and promote a positive childbirth experience. Essential oil aromatherapy has emerged as a complementary therapy that may reduce pain perception through physiological and psychological relaxation mechanisms. This study aimed to analyze the effectiveness of essential oil aromatherapy in reducing labor pain among women giving birth at Zhafira Zharifa Clinic. This study employed a quantitative approach using a quasi-experimental one-group pretest–posttest design. A total of 30 women undergoing normal labor participated in the study. Labor pain intensity was assessed before and after the administration of essential oil aromatherapy through inhalation. Data were analyzed using descriptive statistics and a Paired Sample t-Test with a significance level of 0.05. The results revealed that the mean labor pain score decreased from 67.8 before the intervention to 48.6 after the administration of aromatherapy. Statistical analysis demonstrated a significant difference between pretest and posttest pain scores ($p = 0.000$). These findings indicate that essential oil aromatherapy effectively reduces labor pain among women during childbirth. The reduction in pain intensity may be associated with the stimulation of the limbic system, which promotes relaxation and enhances the release of endorphins and serotonin, thereby decreasing pain perception. The findings suggest that essential oil aromatherapy can be integrated into maternity care as a safe, simple, non-invasive, and cost-effective complementary intervention for labor pain management. The originality of this study lies in its evaluation of aromatherapy effectiveness within a primary healthcare maternity setting using a pretest–posttest approach and direct measurement of labor pain intensity. The study contributes additional empirical evidence supporting the use of complementary therapies in improving maternal comfort during childbirth.

Keywords: aromatherapy; essential oils; labor pain; childbirth; complementary therapy.

INTRODUCTION

Childbirth is a physiological process that marks the end of pregnancy and represents one of the most significant experiences in a woman's life. Although labor is a natural process, it is often accompanied by intense pain resulting from uterine contractions, cervical dilatation, and stretching of the birth canal tissues. Labor pain not only causes

physical discomfort but may also affect the mother's psychological condition, leading to anxiety, fear, and excessive stress. The World Health Organization (WHO) reports that most women experience moderate to severe pain during labor, which, if not properly managed, may increase physiological stress responses, prolong the labor process, and negatively affect both maternal and fetal well-being (WHO, 2018). Therefore, labor pain management remains an essential component of maternity care aimed at improving maternal comfort and promoting a positive childbirth experience.

Previous studies have emphasized the importance of effective labor pain management through both pharmacological and non-pharmacological approaches. The first group of studies focuses on the impact of labor pain on maternal and fetal conditions. Cunningham et al. (2018) explained that uncontrolled labor pain may increase catecholamine and cortisol levels, potentially interfering with uterine contractions and reducing uteroplacental perfusion. Lowdermilk et al. (2019) further noted that heightened stress during labor may intensify pain perception and delay labor progression. Similarly, Simkin and Ancheta (2018) described the "fear–tension–pain" cycle, in which anxiety and fear contribute to increased pain intensity during childbirth. These findings suggest that labor pain is not merely a physical phenomenon but is also closely associated with psychological factors that require comprehensive management.

The second group of studies highlights the effectiveness of non-pharmacological interventions in reducing labor pain. Smith et al. (2018), through a Cochrane systematic review, reported that interventions such as relaxation techniques, massage, hydrotherapy, music therapy, and aromatherapy can help reduce pain intensity and improve maternal satisfaction with the childbirth experience. Lee and Lee (2021) further demonstrated through a meta-analysis that aromatherapy significantly reduces both pain and anxiety during labor. Likewise, Burns et al. (2018) found that aromatherapy use in maternity care settings enhances maternal comfort without causing significant adverse effects. These findings indicate that complementary therapies have gained increasing attention as safe alternatives for labor pain management.

The third group of studies specifically investigates the application of essential oils in maternity care. Tiran (2019) explained that essential oils act through olfactory stimulation, which influences the limbic system and promotes the release of endorphins and serotonin, natural substances associated with pain relief and relaxation. Sheikhan et al. (2019) found that aromatherapy significantly reduced labor pain perception and enhanced maternal

relaxation. Similarly, Sari et al. (2022) reported that lavender aromatherapy effectively reduced labor pain intensity among both primigravida and multigravida mothers. Comparable findings were reported by Rahayu and Wulandari (2023), Putri et al. (2023), and Smith et al. (2020), who concluded that essential oil aromatherapy may reduce the need for additional analgesics while improving maternal comfort throughout labor.

Despite the growing body of evidence supporting the effectiveness of aromatherapy in labor pain management, several research gaps remain. Most previous studies have been conducted in hospitals or healthcare facilities with relatively comprehensive resources, whereas research in primary healthcare settings remains limited. In addition, many studies have focused on maternal anxiety and comfort rather than directly measuring changes in pain intensity using a pretest–posttest design. At the local level, empirical evidence regarding the effectiveness of essential oil aromatherapy in maternity services remains scarce. Therefore, further studies are needed to strengthen the scientific basis for implementing aromatherapy as a complementary therapy in clinical obstetric practice.

Based on these considerations, this study aims to analyze the effectiveness of essential oil aromatherapy in reducing labor pain among women giving birth at Zhafira Zharifa Clinic. This study is expected to provide scientific evidence regarding the benefits of aromatherapy as a safe, practical, and cost-effective complementary intervention for labor pain management.

This study is based on the argument that essential oil aromatherapy may reduce labor pain through physiological and psychological relaxation mechanisms. Inhaled aromatic compounds stimulate the limbic system, leading to increased release of endorphins and serotonin, which subsequently reduce pain perception, alleviate anxiety, and promote relaxation during labor. Therefore, the research hypothesis is that essential oil aromatherapy has a significant effect on reducing labor pain among women in labor.

RESEARCH METHOD

This study employed women undergoing normal labor at Zhafira Zharifa Clinic as the unit of analysis. The primary focus of the research was to examine changes in labor pain intensity before and after the administration of essential oil aromatherapy. Labor pain was selected as the main outcome variable because it is one of the most common challenges experienced during childbirth and may significantly affect both maternal physical and

psychological well-being. The study sought to determine the extent to which essential oil aromatherapy could serve as a complementary therapy for reducing labor pain.

A quantitative approach was adopted using a quasi-experimental one-group pretest–posttest design. This design was chosen because it allows researchers to compare pain intensity experienced by the same participants before and after receiving the intervention. Through this approach, the effectiveness of essential oil aromatherapy could be directly evaluated based on changes in pain scores following treatment. A quantitative design was considered appropriate because the study focused on measuring and statistically analyzing numerical changes in labor pain intensity.

The study utilized both primary and secondary data sources. Primary data were obtained directly from women in labor through assessments of pain intensity before and after the administration of essential oil aromatherapy. Secondary data were collected from scientific journals, obstetric textbooks, healthcare guidelines, and other relevant literature concerning labor pain, complementary therapies, and the use of aromatherapy in maternity care. These secondary sources were used to strengthen the theoretical framework and support the interpretation of the findings.

Data collection was conducted through observation and pain assessment using a standardized pain measurement instrument. Prior to the intervention, participants were asked to rate the intensity of labor pain they experienced, which served as the pretest measurement. Subsequently, essential oil aromatherapy was administered according to the procedures established at the healthcare facility. The aromatherapy intervention was delivered through inhalation, allowing participants to inhale the aroma of the essential oils during labor. Following the intervention period, labor pain intensity was reassessed using the same instrument to obtain posttest data. Throughout the study, participant safety, comfort, and informed consent were carefully maintained.

Data analysis consisted of descriptive and inferential statistical procedures. Descriptive statistics were used to summarize participant characteristics and mean pain scores before and after the intervention. Prior to hypothesis testing, the data were examined to ensure compliance with the assumptions required for parametric statistical analysis. Subsequently, a Paired Sample t-Test was performed to determine whether a significant difference existed between labor pain intensity before and after the administration of essential oil aromatherapy. A significance level of $\alpha = 0.05$ was applied. A p-value less

than 0.05 was interpreted as evidence that essential oil aromatherapy had a statistically significant effect on reducing labor pain among women in labor.

RESULT

Participant Characteristics

A total of 30 women undergoing normal labor at Zhafira Zharifa Clinic participated in this study. Participant characteristics were analyzed to provide an overview of the study population.

Table 1. Distribution of Participants by Age

Age Group (Years)	Frequency (n)	Percentage (%)
< 20	3	10.0
20–35	22	73.3
> 35	5	16.7
Total	**30**	**100.0**

Table 1 shows that the majority of participants were between 20 and 35 years old, accounting for 73.3% of the total sample. This age group represents the optimal reproductive age and is commonly associated with normal labor outcomes.

Table 2. Distribution of Participants by Parity

Parity	Frequency (n)	Percentage (%)
Primiparous	12	40.0
Multiparous	18	60.0
Total	**30**	**100.0**

As presented in Table 2, most participants were multiparous women (60.0%), while primiparous women accounted for 40.0% of the sample. This finding indicates that the majority of participants had previous childbirth experience.

Labor Pain Intensity Before and After Essential Oil Aromatherapy

The effectiveness of essential oil aromatherapy was evaluated by comparing labor pain scores before and after the intervention.

Table 3. Mean Labor Pain Scores Before and After Aromatherapy

Variable	Mean Score	SD
Pretest	67.8	8.4
Posttest	48.6	7.1

Table 3 demonstrates that the mean labor pain score before the administration of essential oil aromatherapy was 67.8. Following the intervention, the mean pain score decreased to 48.6. The results indicate a reduction of 19.2 points in labor pain intensity after aromatherapy was administered.

This decrease suggests that participants experienced a substantial improvement in comfort during labor after receiving the aromatherapy intervention. The observed reduction indicates the potential effectiveness of essential oil aromatherapy as a complementary pain management strategy during childbirth.

Effect of Essential Oil Aromatherapy on Labor Pain

To determine whether the reduction in labor pain intensity was statistically significant, a Paired Sample t-Test was conducted.

Table 4. Paired Sample t-Test Results for Labor Pain Intensity

Variable	Mean	SD	t-value	p-value
Pretest	67.8	8.4		
Posttest	48.6	7.1	12.764	0.000

As shown in Table 4, the Paired Sample t-Test produced a p-value of 0.000 ($p < 0.05$), indicating a statistically significant difference between labor pain intensity before and after the administration of essential oil aromatherapy.

The findings demonstrate that essential oil aromatherapy significantly reduced labor pain among women in labor. The substantial decrease in pain scores supports the hypothesis that aromatherapy can serve as an effective complementary intervention for labor pain management. The results further suggest that inhalation of essential oils may contribute to maternal relaxation and improved comfort during childbirth.

Overall, three major findings emerged from this study. First, the majority of participants were within the optimal reproductive age group and had previous childbirth experience. Second, labor pain intensity decreased considerably following the aromatherapy intervention. Third, statistical analysis confirmed that the reduction in pain intensity was significant, providing empirical evidence of the effectiveness of essential oil aromatherapy in reducing labor pain during childbirth.

DISCUSSION

The findings of this study demonstrated that essential oil aromatherapy significantly reduced labor pain among women giving birth at Zhafira Zharifa Clinic. The mean labor pain score decreased from 67.8 before the intervention to 48.6 after the administration of aromatherapy, with statistical analysis indicating a significant difference ($p = 0.000$). These results suggest that essential oil aromatherapy is an effective complementary intervention for reducing labor pain and improving maternal comfort during childbirth.

The reduction in labor pain observed in this study can be explained through the physiological and psychological mechanisms of aromatherapy. Essential oils stimulate olfactory receptors that transmit signals directly to the limbic system, a region of the brain associated with emotions, memory, and pain perception. Activation of the limbic system promotes the release of neurotransmitters such as endorphins and serotonin, which contribute to relaxation, emotional stability, and natural pain relief. As a result, mothers may experience lower pain perception and reduced anxiety during labor. In addition, aromatherapy may decrease sympathetic nervous system activity, thereby reducing stress-related physiological responses that often intensify labor pain.

The present findings are consistent with previous studies investigating the effectiveness of aromatherapy during childbirth. Lee and Lee (2021) reported that aromatherapy significantly reduced labor pain and maternal anxiety through its calming and analgesic effects. Similarly, Sheikhan et al. (2019) found that women receiving aromatherapy during labor reported lower pain scores and greater relaxation compared to those receiving standard care. Burns et al. (2018) also demonstrated that aromatherapy could improve maternal comfort and satisfaction during childbirth without causing significant adverse effects. The consistency of these findings with the current study strengthens the evidence supporting aromatherapy as a beneficial complementary therapy in maternity care.

The effectiveness of aromatherapy may also be associated with its influence on maternal psychological well-being. Labor pain is not solely determined by physiological factors but is also shaped by emotional responses such as fear, anxiety, and tension. According to Simkin and Ancheta (2018), negative emotions during labor can intensify pain perception through the fear–tension–pain cycle. Aromatherapy helps interrupt this cycle by promoting relaxation and creating a more positive emotional environment. Consequently, mothers may feel calmer, more confident, and better able to cope with labor contractions, leading to a reduced perception of pain.

From a broader perspective, the findings of this study have important implications for maternal healthcare services. As concerns regarding the side effects of pharmacological analgesia continue to increase, healthcare providers are encouraged to incorporate safe and evidence-based complementary interventions into routine maternity care. Aromatherapy represents a practical, low-cost, and non-invasive option that can be easily implemented in primary healthcare facilities, maternity clinics, and birth centers. Midwives can integrate aromatherapy into labor support programs to enhance maternal comfort while maintaining patient safety and satisfaction.

The novelty of this study lies in its evaluation of essential oil aromatherapy within a primary healthcare maternity setting using a quasi-experimental pretest–posttest design. While many previous studies have focused on hospital-based interventions or broader assessments of maternal comfort and anxiety, this study directly measured changes in labor pain intensity before and after aromatherapy administration. Therefore, the findings provide additional empirical evidence supporting the effectiveness of aromatherapy as a complementary strategy for labor pain management in local maternity care settings.

Despite its positive findings, this study has several limitations. The use of a one-group pretest–posttest design without a control group limits the ability to establish causal relationships with complete certainty. In addition, the relatively small sample size may restrict the generalizability of the findings to broader populations. The study also focused exclusively on short-term pain outcomes during labor and did not evaluate longer-term maternal satisfaction or postpartum recovery. Future studies are recommended to employ randomized controlled trial designs, include larger and more diverse samples, and investigate additional outcomes such as maternal anxiety, childbirth satisfaction, and postpartum well-being.

Overall, the results indicate that essential oil aromatherapy is an effective complementary intervention for reducing labor pain and enhancing maternal comfort during childbirth. The integration of aromatherapy into maternity care practices may contribute to a more positive childbirth experience and support the provision of holistic, woman-centered care.

CONCLUSION

This study concludes that essential oil aromatherapy has a significant effect on reducing labor pain among women giving birth at Zhafira Zharifa Clinic. The findings

demonstrated a substantial decrease in mean labor pain scores from 67.8 before the intervention to 48.6 after the administration of aromatherapy. Statistical analysis confirmed that the reduction was significant ($p = 0.000$), indicating that essential oil aromatherapy is an effective complementary intervention for labor pain management. These results suggest that aromatherapy can contribute to improved maternal comfort and a more positive childbirth experience.

The scientific contribution of this study lies in providing empirical evidence regarding the effectiveness of essential oil aromatherapy in reducing labor pain within a primary healthcare maternity setting. The findings support existing theories concerning the role of olfactory stimulation, relaxation responses, and neurophysiological mechanisms in pain reduction. Furthermore, this study contributes to the growing body of literature advocating the integration of non-pharmacological and complementary therapies into routine maternity care. The results may serve as a reference for healthcare professionals, particularly midwives, in developing holistic and woman-centered approaches to labor pain management.

Despite its contributions, this study has several limitations. The use of a one-group pretest–posttest design without a control group limits the ability to establish a definitive causal relationship between the intervention and the observed outcomes. In addition, the relatively small sample size may reduce the generalizability of the findings to broader populations. Future research should employ randomized controlled trial designs, include larger and more diverse participant groups, and investigate additional outcomes such as maternal anxiety, childbirth satisfaction, labor duration, and postpartum recovery. Such studies would provide a more comprehensive understanding of the effectiveness of essential oil aromatherapy in maternity care and further strengthen the evidence base for its clinical application.

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