

# Inhalation Aromatherapy Using Lavender Essential Oil to Decrease the Intensity of Labor Pain in Active Phase of First Stage Among Primiparous

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## ABSTRACT

Labor pain is caused by contractions of the myometrium, stretching the lower segment of the uterus and cervix, as well as uterine muscle ischemia as physiological processes that cause pain, fear, and worry that can impact both the mother and fetus. One non-pharmacological method for pain management through encephalins production is aromatherapy. The purpose of this study was to determine the effect of lavender aromatherapy by inhalation on reducing the intensity of physiological labor pain in the active phase of first stage among primiparous. The design of this study was experimental with a one-group pretest-posttest without control group in 20 people who were given lavender aromatherapy when the cervical dilatation was 6 cm. Data were analyzed using paired t-test with the results showing that lavender aromatherapy was proven to significantly reduce the intensity of physiological labor pain during the active phase (p-value <0.05). Inhalation therapy with lavender aromatherapy can be used as an alternative in midwifery practice to reduce the intensity of physiological labor pain in the active phase of first stage among primiparous.

**Keywords:** Lavender aromatherapy, Pain, Labor, Primiparous

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## INTRODUCTION

Labor is a physiological process that is served by a mother. In general, pregnant women expect a normal, safe, and comfortable delivery with minimal pain. However, primiparous mothers experienced greater pain due to stronger than multiparous [1]. Labor pain is one of the most severe pain and its intensity varies depending on each individual [2]. The most dominant labor pain for a long time is felt at the first stage. When entering the active phase, the pain is heavier and results in the spread of painful sensations [3].

Efforts to manage pain during labor can use pharmacological and non-pharmacological methods. Pharmacological methods to reduce labor pain can use systemic drugs, inhalation anesthetics, general anesthesia, and regional anesthesia. Meanwhile, non-pharmacological methods include psychoprophylaxis, hypnotism, acupuncture, healing touch therapy, relaxation exercises, massage therapy, music therapy, and others. Non-pharmacological methods for pain relief include a variety of techniques to overcome not only the physical sensation of pain but also psychologically induced because of pain [4].

A non-pharmacological method using various plant extracts for pain relief is aromatherapy [5]. Essential oils used for aromatherapy can be given through the skin (massage), inhalation, compresses, baths, and oral administration. Aromatherapy is believed to be an effective way to manage pain and

have a psychological impact [6]. Lavender (*Lavandula angustifolia*) aromatherapy is a therapeutic action that is useful for improving the physical and psychological condition of the mother in labor. Physically it is good to use it to reduce pain, while psychologically can relax the mind, reduce tension, and anxiety and provides calmness [7]. The soothing odor will stimulate the thalamus to secrete enkephalin which acts as a natural pain reliever and results in a feeling of relaxation. Enkephalins are similar to endorphins, which are chemicals that have a similar structure to opioids. Enkephalins are thought to cause presynaptic and postsynaptic barriers. This process achieves inhibition of enkephalins by inhibiting P substance so that pain does not or decreases to be transmitted to the brain [8],[9]. It is expected that the provision of non-pharmacological therapy by giving lavender aromatherapy by inhalation can reduce the intensity of physiological labor pain in primiparous.

## MATERIALS AND METHODS

### Design and Samples

This study used an experimental design with one group pretest-posttest without control [10]. The sampling technique was taken by purposive sampling with total 20 people. Respondents selected were primigravida mothers with estimated labor from November 2019 to January 2020, maternal age 20-35 years, physiological pregnancies with gestational age above 37 weeks, head presentation, cervical dilatation of 6 cm, and have not received pharmacological therapy to reduce pain before.

### Data Collection

The first assessment was carried out before the intervention using the Universal Pain Assessment Tool sheet for observation of the pain scale. Respondents choose a pain range from a scale of 0-10 according to the level of pain they feel.

Lavender essential oil was made by Young Living Essential Oils. Add 4 drops of lavender essential oil to 100 ml of distilled water in a diffuser. Respondents were asked to inhale lavender aromatherapy for 10 minutes and then measured the pain scale. The lavender aromatherapy was continued or stopped after posttest observation according to the respondent's agreement.

The research was conducted in PMB Sri Sayekti, Kediri, East Java from November 2019 to January 2020. The study protocol was approved by the Health Research Ethics Committee of the Institute of Health Sciences Strada Indonesia with Number: 1628 / KEPK / X / 2019.

### Data Analysis

Data were analyzed by SPSS version 20 using the Kolmogorov Smirnov test to determine the normality of the data, then hypothesis testing using paired t-test.

## RESULTS

The results of the frequency distribution of pain among respondents before and after the intervention can be seen in Table 1.

**Table 1.** Distribution of frequency of pain among respondents before and after the intervention

	Pre-test	Post-test
Mild pain	0	2
Moderate pain	3	17
Severe pain	17	1
Worst pain	0	0

Based on table 1, before being given lavender aromatherapy intervention, the average intensity of the pain scale felt by respondents was 7.65 with details of 3 people (15%) felt moderate pain, 17 people (85%) felt severe pain and no one felt mild or worst pain. Meanwhile, after being given lavender aromatherapy intervention the average intensity of the respondent's pain scale was 4.65, with details of 2 people (10%) feeling mild pain, 17 people (85%) experiencing moderate pain, and 1 person (5%) experiencing severe pain. It can be concluded that the pain intensity after being given lavender aromatherapy is lower than the pain intensity before being given lavender aromatherapy.

**Table 2.** The intensity of labor pain during the active phase of first stage among primiparous based on the Universal Pain Assessment Tool before and after the intervention

	Mean $\pm$ SD	df	T	p-value
Pre-post test	3.000 $\pm$ 0.795	19	16.882	0.000

This table shows the results of paired t-test which states that there is a significant difference (p-value  $<0.05$ ) between the pain during the active phase before receiving lavender aromatherapy and after receiving lavender aromatherapy. It can be concluded that inhalation therapy with lavender aromatherapy can reduce the intensity of physiological labor pain during the active phase.

The intensity of labor pain starts from mild and increases over time, in other words, the wider cervical dilatation the higher the pain intensity felt by the mother in labor. Therefore, to compare the difference in pain intensity between respondents, it would be more effective to see the pain intensity at the same cervical dilatation, so the researchers measured the pain intensity of the respondents in this study on the 6 cm of cervical dilatation to reduce bias. The choice of the 6 cm cervical dilatation was due to the starting peak of labor pain, which is in 5 cm cervical dilatation [11].

Aromatherapy using essential oils derived from aromatic plant extracts is believed to be useful for treating, balancing the mind, body, and spirit. Essential oils from aromatic plants are considered as natural sedatives, stimulants, and relaxing neurotransmitters (paracrine and endocrine) [12], [13]. The mechanism involves the integration of essential oils into the signal receptor cells in the nose when inhaled. These signals are transmitted to the limbic and hypothalamus parts of the brain via the olfactory bulb that causes the brain to release neuro messengers such as serotonin and endorphins, thus providing a calming effect on the body and mind [14],[15].

Lavender as one of the aromatherapy plants used as aromatherapy is believed to have analgesic effects because it releases neurotransmitters such as enkephalin, endorphins, noradrenaline, and serotonin, which reduce the response of autonomic nerves to pain stimuli [16], [17]. Lavender contains linalool, ketones, and linalyl acetate which have a sedative effect to reduce pain, drowsiness, and anti-inflammatory [18]. Besides, one of the lavender essential oil ingredients is 1,8-cineol which can block the formation of pain mediators, such as prostaglandins and leukotrienes by preventing the metabolism of arachidonic acid [19], [20].

The results of this study are consistent with research conducted by Ahmadi et al. (2013) and Vakilian et al. (2011) who stated a significant reduction in the intensity of labor pain in women in the intervention group using aromatherapy with lavender essential oil inhalation [21], [22].

## DISCUSSION

The intensity of labor pain starts from mild and increases over time, in other words, the wider cervical dilatation the higher the pain intensity felt by the mother in labor. Therefore, to compare the difference in pain intensity between respondents, it would be more effective to see the pain intensity at the same cervical dilatation, so the researchers measured the pain intensity of the respondents in this study on the 6 cm of cervical dilatation to reduce bias. The choice of the 6 cm cervical dilatation was due to the starting peak of labor pain, which is in 5 cm cervical dilatation [11].

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## CONCLUSION

Currently, aromatherapy is considered as a therapeutic alternative that has a positive impact and is being tested in various studies. The results of this study confirm that aromatherapy with lavender essential oil is a simple, inexpensive, noninvasive, and effective intervention to reduce labor pain. Inhalation therapy with lavender aromatherapy can be used as an alternative in obstetric practice to reduce the intensity of physiological labor pain in the active phase of first stage among primiparous. In this study, it was only performed when the cervical dilatation was 6 cm and for a short time. Therefore, further research is needed on different cervical dilation phases and in a longer time.

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## CONFLICTS OF INTEREST

The author declares that they have no conflict of interest

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