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The Effectiveness of Lavender Aromatherapy Oil and Candle to Reduce The Pain in The Active Phase of 1st Stage of Labor

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ABSTRACT

Background: The period of labor often causes excessive anxiety in the mother due to the pain felt. It can affect the delivery process. Various non-pharmacologic methods have been developed to reduce labor pain.

Purpose: This study aimed to assess the different in the effectiveness of lavender aromatherapy with oil and candles to be inhaled on reducing labor pain in the first stage of the active phase of labor.

Methods: This was a quantitative study and a quasi-experimental design with a pretest-posttest design with a control group. The sampling technique used purposive sampling with a total sample of 60 respondents. Samples were taken randomly and divided into three groups (aromatherapy oil, aromatherapy candles, control). Labor pain was measured using a numeric rating scale in the first stage of labor before and after the intervention. The research analysis used the Anova test which was useful to determine the difference in the effectiveness of candles and aromatherapy oils in reducing labor pain.

Results: Candles and lavender aromatherapy oil can reduce labor pain in the first stage of active phase of labor compared than control (p-value= 0.001). Lavender oil was found to be more effective in reducing pain compared to lavender aromatherapy candles, with the means score of labor pain after administration of lavender oil was 3.50 compared to lavender aromatherapy candles was 5.05.

Conclusion: Lavender aromatherapy oil found to be more effective in reducing labor pain in the first stage of active phase compared to aromatherapy candles. Midwife could facilitate the administration of lavender aromatherapy to reduce pain during labor

Keywords: *lavender aromatherapy candles, lavender aromatherapy oils, labor pain*

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BACKGROUND

Anxiety during labor can physiologically cause uterine contractions to become more painful for the intrapartum mother. Anxiety experienced by pregnant women during labor stimulates the body to secrete catecholamine hormones and adrenaline hormones which cause smooth muscle tension and vasoconstriction in blood vessels, resulting in a decrease in uterine contractions which allows prolonged labor to occur (Marie et al., 2007). Pain due to labor has a significant effect on overtime labor in low-risk primigravida (Curzik & Jokic-Begic, 2011a).

The use of aromatherapy can reduce the level of anxiety in labor and reduce pain by 71%, deliveries that require local anesthesia or choosing delivery by cesarean section also decrease the case, which is only 14% (Kheirkhah et al., 2013b). The results of other studies also recommend that using lavender aromatherapy can reduce labor pain and have an impact on reducing labor by cesarean section without indications caused by fear of labor pain (Kaviani et al., 2014b).

Pain during labor can be eliminated through pain reduction management, namely by pharmacological and non-pharmacological methods (Kaviani et al., 2014a). Pharmacological methods include epidural analgesia, spinal analgesia, and intrathecal labor analgesia. Non-pharmacological pain management in pregnancy and childbirth is a relaxation method that is cheaper, effective, simple, and without side effects (Adams et al., 2015). Aromatherapy is one of the non-pharmacological therapies to reduce pain, which is a complementary therapy that involves the use of fragrances derived from essential oils (van Wyk, 2008). Oils present in plant parts such as Lavandula angustifolia or lavender are flowering plants from the family *lamiaceae* originating from the Western Mediterranean region, reacting to cell membranes, and causing changes in the activity of ion channels and nervous receptors so that they have a calming and anti-bacterial effect.

Aromatherapy lavender in addition to containing the phytochemicals linalool, linalyl acetate, and pinene and1,8-cineole but also contains esters, which are known for their relaxing, analgesic, and strong affinity for acetylcholine receptor sites, have a direct effect on the olfactory organs and are perceived by the brain for reacting substance of neurochemicals such substances as endorphins and serotonin so as to provide a reaction which makes the effect comforting and soothing to the body (Olapour et al., 2013). The one of study results showed that the use of essential oils of lavender significant effect in reducing the intensity of pain and helps the body to relax (Tanvisut et al., 2018). Another quasi experimental study on 22 mothers after cesarean section found that lavender aromatherapy using candles in the room significantly reduced the postoperative pain scale (p value = 0.000) (Haniyah & Setyawati, 2018).

The results of the study prove that lavender essential oil aromatherapy has a significant effect on reducing pain intensity in the first stage of the latent phase, active phase, and transitional phase, besides that it also has a significant effect on the duration of the first and third stage of primigravida labor (Mansour & Lamadah, 2016). Massage using lavender aromatherapy oil has also been shown to be significant in reducing pain and duration of the 2nd and 3rd stages of labor (Vakilian et al., 2018). The results of a preliminary study in the delivery room of the Independent Practicing Midwife in Depok, from 10 intrapartum mothers, 2 patients experienced severe pain, 7 patients experienced moderate pain, and 1 patient experienced mild pain. A lot of research on aromatherapy is very effective in reducing labor pain, but which is more effective in reducing labor pain between lavender aromatherapy using oil or using aromatherapy candles to be inhaled is still not clearly known (Curzik & Jokic-Begic, 2011b; Mansour & Lamadah, 2016; Olapour et al., 2013).

OBJECTIVE

This study objective was to assess the different in the effectiveness of lavender aromatherapy with oil and candles to be inhaled on reducing labor pain in the first stage of the active phase of labor.

METHODS

This study used a quantitative study and a quasi-experimental design with a pretest-posttest design with control group. The sampling technique used purposive sampling with a total sample of 60 respondents. Samples were taken randomly and divided into three groups, namely; the group that was given lavender aromatherapy with oil and then inhaled it, the group that inhaled aromatherapy from lit aromatherapy candles and the control group. Each group consists of 20 people. The inclusion criteria of this study were intra partum mothers at cervical dilatation 4 – 8 cm, uterine contractions at least 3 times in 10 minutes with a duration of 40 minutes, presentation of the lowest part of the fetus is the head. While the exclusion criteria from this study were mothers who had used lavender aromatherapy either in the form of oil or aromatherapy candles, respondents who were allergic to fragrances and the condition of the mother and fetus was not healthy.

For the lavender aromatherapy group with oil, the method of administration was to drop 3 drops of oil on a cotton swab and then inhale the fragrance during the first stage of the research process. As for the aromatherapy group with candles, the scent of lavender was inhaled from the burning candles and the fragrance spread across the room. The candles were lit 15 minutes before the mother enters the room, the distance between the candle and mother was 30 cm.

For pain assessment was using a numeric rating scale (NRS), which is a questionnaire containing questions about the level of labor pain felt by the respondent, then the researcher classifies the pain felt based on the verbal response of the respondent. The perceived pain intensity scale corresponds to a pain scale range of 1-10. The pain scale was calculated before and after the intervention. If the pain score is high, then the pain is interpreted as getting worse.

For data analysis, test data that were normally distributed using the paired Anova test and using the Wilcoxon test if not normally distributed. The analysis to determine the effect of aromatherapy, the test used was the unpaired Anova test if the data is normally distributed, and using the Mann-Whitney test if the data is not normally distributed.

This research was carried out after receiving a research ethic feasibility letter from the ethics committee team of the Poltekkes Kemenkes Jakarta III, with the ethical approval letter number was LB.01.01/I/KE/L/452a/2015. Each respondent who was a research subject has given consent to become a research respondent and has the right to stop the research process at any time.

RESULTS

The following is table 1, which describes the characteristics of respondents from the study. Based on table 1, the characteristics of the respondents studied include age, ethnicity, parity, psychological condition, and physical condition. In terms of age, ethnicity, parity, and physical condition, p-value> 0.05 ($p>0.05$) indicates that there was no significant difference in these characteristics. However, in psychological conditions, a p-value of 0.000 was obtained ($p < 0.05$) which indicates that there was a significant psychological difference between intrapartum mothers between groups.

Table 1 Characteristic respondents

Characteristics	Group			p-value
	Candle	Oil	Control	
Age (year)				
20 - 30	8 (42.1%)	14 (70%)	13 (65%)	0.579
≥ 30	11 (57.9%)	6 (30%)	7 (35%)	
Ethnicity				
Betawi	8 (42.1%)	5 (25%)	6 (30%)	0.906
Others	11 (57.9%)	15 (75%)	14 (70%)	
Parity				
Primipara	6 (31.6%)	10 (50%)	10 (50%)	0.412
Multipara	13 (68.4%)	10 (50%)	10 (50%)	
Psychological condition				
Anxiety	19 (100%)	16 (80%)	19 (95%)	0.001
Relax / calm	0 (0%)	4 (20%)	1 (5%)	
Physical condition				
Good	18 (94.7%)	17 (85%)	13 (65%)	0.051
Not good	1 (5.3%)	3 (15%)	7 (35%)	

Furthermore, table 2 and figure 1 explains the effect of aromatherapy on reducing labor pain based on each intervention and control group. Based on table 2 and figure 1, it is known that there was a significant reduction in pain from the two intervention groups giving lavender aromatherapy to the group that was given oil and with candles compared to the control group. P value for both groups was 0.001.

Table 2 Changes in the intensity of labor pain in the first stage of active phase before and after treatment in the treatment and control groups

Aromatherapy	Means ± SD		t	p-value
	Pre test	Post test		
Candle	7.05 ± 1.27	5.05 ± 1.13	10.677	0.001
Lavender oil	5.2 ± 0.77	3.5 ± 0.76	10.376	0.001
Control	5.65 ± 1.31	7.4 ± 1.23	-12.254	0.001

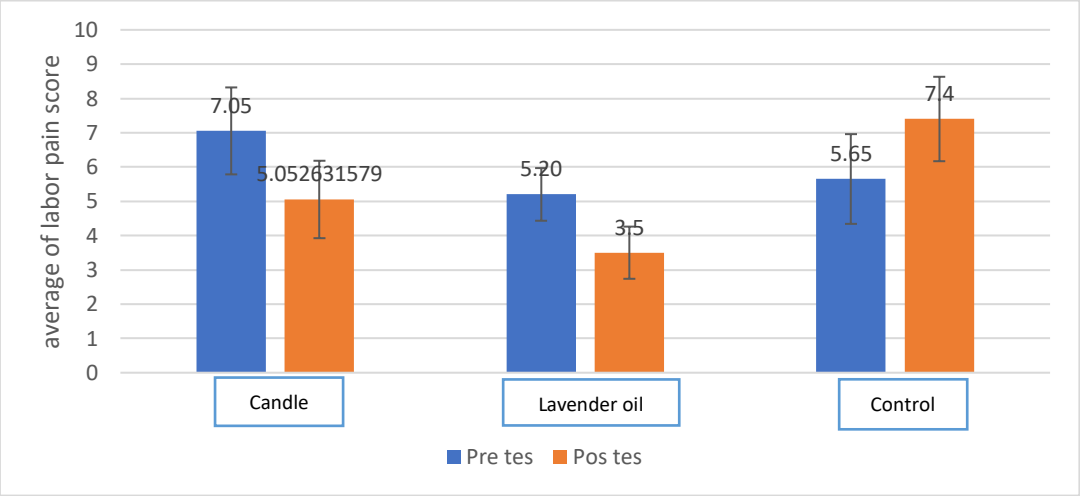

Figure 1. Differences in the average value of labor pain before and after treatment in each group

Then, table 3 explains the effectiveness between the two intervention groups, namely with lavender oil or with lavender aromatherapy candles.

Table 3. The Effectiveness of Aromatherapy Lavender Oil and Lavender Wax on Labor Pain in the First Stage of Active Phase in the Treatment Group

Treatment	Mean ± SD	p-value
Candle	5.053 ± 1.129 [b]	
Lavender oil	3.5 ± 0.761 [a]	0.001
Control	7.4 ± 1.231 [c]	

Note: On mean ± SD, if it contains different letters, it means that their indifference a significant($p<0.05$) and if it contains the same letters, it means that there is no significant difference ($p> 0.05$).

Based on the table 3, the result analysis using ANOVA, obtained a p-value of 0.001, smaller than = 0.05 ($p>0.05$). This result can be concluded that there was a significant effect of giving aromatherapy to decrease the labor pain. In the candle and lavender oil aromatherapy group, labor pain was lower than the control group, indicating that the administration of aromatherapy using both candles and lavender oil was able to significantly reduce labor pain. The mean score of pain in the administration of lavender oil was lower than the group given candles aromatherapy and control (Mean ± SD=3.5 ± 0.761). It appears that lavender oil was more effective in reducing labor pain compared to the aromatherapy candle group and the control group.

DISCUSSION

In our study, aromatherapy with lavender oil appeared to be more effective in reducing labor pain compared to aromatherapy using candles and the control group. Aromatherapy is a non-pharmacological therapy that can be used to reduce pain, also known as complementary therapy that uses essential oil fragrances and can be combined with base oil to be used by inhalation or massage into the skin (Bouya et al., 2018; Sánchez-Vidaña et al., 2017). The way aromatherapy works in reducing pain is related to the secretion of endorphins and noradrenaline by affecting the nervous system, and it can create psychological and physical effects on the body.

The results of this study are in accordance with a randomized control clinical trial at El Shatby Maternity Hospital in Alexandria Egypt on 60 normal primigravida pregnant women with a cervical dilatation of 3-4 cm, found that the administration of lavender oil aromatherapy massaged was more effective in reducing labor pain in the early stages of active labor compared with the group carried out with ordinary oil (Mansour & Lamadah, 2016).

The use of aromatherapy in relieving labor pain provides significant results in reducing pain. This is consistent with a randomized controlled trial study on 80 primiparous mothers in Iran. This study states that the aroma of the oil released is able to provide satisfaction for maternity mothers to feel relaxed. So that with a relaxed physical and mental condition can relieve labor pain. Labor pain in the second stage decreased with p value < 0.001 in the group given aromatherapy compared to the control group (Kheirkhah et al., 2013a).

A prospective randomized controlled trial (RCT) with two arms comparing lavender aromatherapy massage and massage without aromatherapy groups in labor conducted in Iran on 60 primiparous people also reported the same result that there was a decrease in labor pain intensity in women giving birth in the first stage during the opening cervix 4cm to 10cm (Zahra, 2013).

Giving lavender oil aromatherapy with the inhalation method seems effective in reducing labor pain. This is closely related to the mother's level of satisfaction with the

outcome of childbirth which is closely related to the experience of pain. By avoiding severe pain, it has a positive effect on the labor experience (Raju, 2014b).

Labor pains must be addressed properly by mother during labor, because the impact of uncontrolled labor pain can give poor delivery outcomes such as prolonged labor that ends in cesarean section, and also respiratory failure in newborns (Floris & Irion, 2015; Raju, 2014a; Tabatabaeichehr & Mortazavi, 2020). Pain will be closely related to anxiety which will stimulate the sympathetic nervous system to release stress-related hormones such as noradrenaline, cortisol and adrenaline. These hormones will have the consequence of increasing strong pain and if not handled properly it will increase discomfort to the mother and adversely affect the outcome of labor. For this reason, it is important to carry out a management in providing appropriate midwifery care so that it can help mothers cope with their pain well, including the provision of lavender oil aromatherapy.

Utilization of lavender aromatherapy provides a good response psychologically to mothers in labor especially in reducing labor pain. Lavender aromatherapy can provide a relaxing effect and also contains analgesic compounds and contains linalyl acetate which has a sedative effect which if inhaled the aroma will affect the nervous system and provide a relaxing effect on the body (Yazdkhasti & Pirak, 2016).

This study has several advantages, including using a valid and reliable pain measurement tool, namely the Numeric Rating Scale for Pain (NRS), the accuracy of the results can be properly accounted for (Hawker et al., 2020). However, some limitations of this study need to be considered, such as the effect of other possible factors that influence the results of pain reduction such as massage during the first stage of labor and the presence of a companion who can psychologically provide a relaxing effect were not included in the confounding variables in the study, this could lead to bias in the interpretation of research results.

CONCLUSION

Thus, it can be concluded that the administration of aromatherapy using lavender aromatherapy oil with the inhalation method appears to be more effective in reducing labor pain in the first stage compared to giving lavender aromatherapy with candles whose aroma is inhaled in the room and compared to the control. The effect of giving aromatherapy can be developed by practicing midwives in helping mothers overcome labor pain because from several research results this aromatherapy has been proven to be safe, cheap and effective and there are no harmful side effects for mothers and babies in the uterine.

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