



# The Effectiveness of the Combination of Aromatherapy and Back Massage on Normal Labor Pain Intensity in Stage I of Active Phase in Puskesmas Pontianak City Indonesia

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## **Abstract:**

*Parturition pain is a problem that is felt by a mother during labor that causes excessive fear and anxiety to the mother and her family so that intervention is needed in dealing with pain. The purpose of this study to analyze the effectiveness of combination of aromatherapy and back-massage on parturition pain during the first stage of active phase of normal labor. This study used a quasi-experimental design with two groups with a sample of 60 mothers. This research was conducted at a community health center that provides maternity services in Pontianak City. Pre-test and post-test nonequivalent control group design was conducted where the researcher did not do randomization. Data were analyzed using the Wilcoxon test. The test results showed that the intervention group had a value of  $p 0,0001 < 0.05$  and the control group produced a value of  $p 0.001 < 0.05$ . This means there are differences in the level of pain before and after treatment. Likewise, the Mann-Whitney U-Test statistical test results showed a value of  $p 0.001 < 0.05$ , which means that there are differences in pain intensity between the group of mothers who were given a combination of aromatherapy and back massage and the other group of mothers who got deep breathing relaxation during the process of labor. The combination of aromatherapy and back massage is effective in reducing pain in normal labor in the first phase of the active phase. This therapy is expected to be used as an alternative intervention for a mother in active phase of labor, especially to reduce the intensity of pain in the first phase of the active phase of normal labor.*

## **Keywords:**

*aromatherapy; back massage; parturition pain*

## **I. Introduction**

Labor pain is an unpleasant feeling that occurs during labor. Physiologically, labor pain begins in the first stage of labor, both in the latent and active phases. In the active phase there are openings starting from 3-10. The first stage of Primigravida labor can last for  $\pm 20$  hours, in this phase the pain is caused by uterine contractions and cervical dilatation. The longer it takes, the stronger the pain becomes, especially the peak of pain occurs in the active phase, where the complete opening reaches up to 10 cm. Health and illness are largely determined by the human behavior (Yeni, 2020). In that case, the intensity of pain during labor affects the psychological condition of the mother, childbirth process, and fetal well-being. Pain, tension, fear that interfere with pregnant women can produce excessive amounts of catecholamines (stress hormones) such as epinephrine and norepinephrine. High level of catecholamines in the blood can prolong labor as it reduces the efficiency of uterine contractions and can harm the fetus as the blood flow to the placenta is reduced. This situation can cause labor management to be less controlled and cause trauma to infants (Danish walsh (2013).

Pain during childbirth that occurs more frequently and longer can make the mother anxious, afraid and even stressed out. Which results in the release of excessive hormones such as adrenaline, catecholamines and steroids. As a result, these hormones can cause smooth muscle tension and vasoconstriction of blood vessels thereby reducing blood flow and oxygen to the uterus. This situation then causes uterine ischemia, fetal hypoxia and makes the impulses of pain more severe. In addition, the increasing catecholamia can cause disruption in the strength of uterine contraction that results in uterine inertia which prolongs labor process (Denis walsh., 2013).

According to Wahyuningsih that the delay in pain management can increase maternal and infant mortality. It is because pain can increase breathing and heart rate of the mother so that the blood flow and oxygen to the placenta are disrupted. Management and supervision of labor pain, especially in the first phase is very important, because this can be a determinant whether the mother can give birth normally or end up with an action due to complications caused by extreme pain<sup>3</sup>. Some nonpharmacological methods of dealing with labor pain that are quite effective in reducing labor pain include massage therapy, music, aromatherapy, warm compresses, deep-breathing exercises and birth ball exercises during pregnancy (Solehati, T. 2015). Accordingly, in their study, Chen and colleagues argue that aromatherapy is effective and safe in reducing pain and duration of labor (Chen, S.F. 2019). However, the heterogeneity of some results of their study are different in terms of duration and pain. Thus, it was recommended to apply device-based pain measurement, larger sample size, and improved study design. Another research by Kamble, Mehta, and Shinde affirms that aromatherapy using massage oils, creams, or lotions has the potential to cause side effects such as dermatitis skin eruptions and even shortness of breath (Kamble, R.N., 2014). Therefore, it is recommended not to apply such method to patients with a history of epilepsy, asthma, circulatory disorders skin disorders.

Nevertheless, Ahmed in his study said that massage therapy may be a more effective approach to pain management than position changes. Especially, massage treatment which is carried out at the first stage of labor active phase is a simple and inexpensive procedure (Ahmed, H.M. 2018). It, too, may be used as an additional method to control labor pain without serious side effects<sup>8</sup>. Based on the results of previous studies, aromatherapy and massage are both simple pain management procedures. These therapies can be given to mothers who are in a process of normal labor because they have very low side effects. Especially, they can reduce the pain and relax the mind, reduce tension and anxiety and provide calmness.

A preliminary study was conducted in Gang Sehat Community Health Center (or Puskesmas) and Siantan Hilir Community Health Center of Pontianak city. These two Puskesmas on average receive parturition patient visits up to 50 patients each month. The researcher found that some of the patients, in their first stage of active phase of labor process, experienced unbearable pain in the abdomen, waist, spinal which radiates to the back bone. To overcome such pain, the midwives in the community health centers only gave an intervention of breathing relaxation technique exercise and had never given a combination therapeutic technique of aromatherapy relaxation and back massage to the mothers during delivery process. Therefore, based on this background, the researcher was interested in examining the combination of Aromatherapy relaxation and back massage to reduce the intensity of pain in the first stage of active phase of parturition.

## II. Research Methods

This quasi-experimental study used non-equivalent pretest and posttest control group design. This design employed two groups in which the first group was given a combination treatment of aromatherapy and back massage (the treatment group), while the other group was a control group that was only given breathing relaxation technique. Both groups were given pre-test and post-test, before and after each treatment. This research was conducted at two Community Health Centers or Puskesmas, Puskesmas Gang Sehat and Puskesmas Siantan Hilir, in Pontianak from April to October 2019. The sample consisted of 60 mothers in labor process, 30 respondents were classed into a control group and the other 30 respondents were for the intervention group. The questionnaire in this study employed the numerical pain intensity of *Visual Analog Scale* (VAS). Numerical pain intensity measurement sheet was presented in the form of a straight line with ten points, which was used to observe behaviors that can accurately determine the pain intensity. The next step, after the labor period the researcher then asked about the level of labor pain felt by the respondents. The patients simply chose the level of pain intensity that they felt in accordance with the range of pain intensity indicated by each point or number from the lowest number (0) to the highest (10).

## III. Results and Discussion

### 3.1 Results

#### a. Age

**Table 1.** Frequency Distribution of Respondent Characteristics by Age

No	Age	Respondent Group				P value
		Intervention(n=30)		Control (n=30)		
		n	%	N	%	
1	<20 years	3	10	1	3,3	0,327
2	20-35 years	22	73,3	20	66,7	
3	>35 years	5	16,7	9	30	
Total		30		30		

From table 1 it can be concluded that the characteristics of respondents based on age between the intervention group and the control group are homogeneous ( $P > 0.005, \alpha = 0.05$ ). Most respondents in the control group and intervention group were 20-35 years old. This means that the majority of respondents were physically and psychologically prepared to face the labor process.

#### b. Pregnancy History

**Table 2.** Frequency Distribution of Respondent Characteristics by Gestation Age (n=60)

No	Gestation History	Respondent Group				P value
		Intervention		Control		
		n	%	N	%	
1	<38 weeks	5	16,7	4	13,3	0,574
2	38-41 weeks	25	83,3	25	83,3	

3	>41 weeks	0	0	1	3,3
Total		30	100	30	100

It is shown in table 2 that the characteristics of respondents based on gestation age between the intervention and control groups are homogeneous ( $P > 0.005$ ,  $\alpha = 0.05$ ). Almost all respondents in both groups have gestation age ranging from 38 to 41 weeks.

### c. The Differences in Pain Intensity in the Intervention Group

**Table 3.** The Difference in Pain Scale Before and After Aromatherapy and Back-massage Combination Intervention

Treatment	Mean	SD	Median	Min	Max.	<i>P Normality</i>	<i>P Wilcoxon</i>
Before therapy	6,50	1,167	6,50	4	8	0,008	
After therapy	3,80	0,551	4,00	3	5	0,000	0,000

Table 3 shows the average pain level in the intervention group before being given therapy was 6.50 with a standard deviation of 1.167. While after the intervention the average pain level was at 3.80 with a standard deviation of 0.551. The analysis results showed a significant difference in the average level of pain in the intervention group before and after the intervention ( $P < 0.00$ ,  $\alpha = 0.05$ ).

### d. The Differences in Pain Intensity in the Control Group

**Table 4.** The Distribution of Pain Intensity Average Levels Before and After Deep-Breathing Intervention in Control Group

Treatment	Mean	SD	Median	Min	Max.	<i>P Normality</i>	<i>P Wilcoxon</i>
Before	7,20	0,847	7,00	6	9	0,001	
After	6,47	1,167	7,00	3	8	0,000	0,000

Table 4 above shows that the average level of pain in the control group before given Deep-breathing therapy was at 7.20 with a standard deviation of 0.847. While after the intervention, the average pain level was 6.47 with a standard deviation of 1.167. The analysis found that there was a significant difference in the average level of pain in the control group before and after the period of deep breathing intervention (with a p value of 0.001 ( $p > 0.05$ ),  $\alpha = 0.05$ ).

### e. The Effectiveness of the Combination of Aromatherapy and Back Massage on the Intensity of Pain in the Birth of a Normal Labor

**Table 5.** The Distribution of Mean Difference of Pain Intensity Before and After the Intervention Period in Intervention Group and Control Group

Group	Difference Mean	SD	Min	Max.	<i>P Normality</i>	<i>P Mann Whitney</i>
Intervention	2,70	1,208	1	5	0,004	
Control	0,73	0,944	0	4	0,000	0,000

From table 5 above, it can be learned that the result of the mean reduction in pre to the mean average of pain intensity in post in the intervention-group was 2.70 and in the control-group was 0.73. Thus, the analysis found that there were significant differences in pain mean levels. ( $p < \alpha = 0.05$ ).

### 3.2 Discussion

This research was conducted to 60 respondents in which the respondents were divided into two groups, 30 respondents in the intervention group who were given a combination of lavender aromatherapy relaxation technique and back massage while 30 respondents in the control group were only given deep-breathing therapy. As for the interpretation of the results of the study include the characteristics of respondents and differences in average pain. The results of the study are presented in tabular form with interpretations, while the discussion is presented in narrative form.

#### a. Characteristics of Respondents

The results of the analysis showed that the average age of most respondents was 20-35 years which indicated that the mothers were relatively safe for labor. Kumalasari explains that physical that age range is ideal for marriage and pregnancy because at those ages the function of the reproductive organs is still optimal as well as mental and emotional maturity<sup>9</sup>. The analysis results of average of pain intensity at the first stage of active phase in normal labor in the treatment and control groups indicated that the average labor pain level before the intervention was 6.85 with a standard deviation of 1.117 with a range of scores (6 to 9), Whereas, after the intervention the average intensity was at an average of 6.13 with a range of scores (6 - 6.13). So, with estimated intervals it can be concluded that 95% of the first stage of labor pain before intervention is believed to be in a severe category.

The situation was experienced by respondents who were primigravida mothers who did not have previous experience, both physically and psychologically for the delivery process. This condition affects the perception of pain and the ability to control oneself during the labor process. Whereas multigravida mothers have moderate pain intensity scores, because they consider labor pain as a normal process, despite the fact that they did not have experience on how to reduce pain in normal labor.

This study finding is in line with the study result by Rahimi and colleagues showing that aromatherapy are able to reduce the first stage labor pain<sup>10</sup>. The therapy can greatly help relieve the pain in both latent active phase and the beginning. Thus, it could be used as an additional method to control labor pain without heavy side effects. Accordingly, the statement is affirmed by these study analysis results showing that the average pain level in both groups is

homogenous. Additionally, this study premise is supported by Ahmed's study finding that massage therapy can be applied as an approach of pain management which is more effective than body position changes during the first stages of parturition. Back massage can help pain perception of mother in a labor process (Ahmed, H.M. 2018). Likewise, another study confirms that aromatherapy with lavender essence as an intervention which is simple, inexpensive, non-invasive, and effective to mitigate labor pain (Kundarti, F. I., 2014). Moreover, by applying aromatherapy a mother may find that the whole process of labor becomes an exciting experience which minimalizes the tendency of a mother to carry out a C-operation. Another study finding also has proven that aromatherapy has been successfully treating pain when combined with conventional treatments (Lakhan, S.E., 2016). Therefore, based on the results of analysis above it can be concluded that there is a significant effect of giving aromatherapy and back-massage combination intervention on pain intensity level experienced by a mother during the first stage parturition process.

#### **b. Difference in Pain Intensity in Control Group**

The results of the analysis of the average pain level before and after the control group who were given deep-breathing intervention showed that the average pain level before the intervention was 7.20 with a standard deviation of 0.847 with the highest value of 9 and the lowest value of 6. Meanwhile after the intervention, the level of the mean pain intensity was 6.47 with a standard deviation of 1.167, with the highest value of 8 and the lowest value of 3. Therefore, the results of the analysis found that there was a significant difference in the average pain level in the control group before and after the intervention period ( $P < 0,000, \alpha = 0.05$ ).

The finding above is in line with the previous study finding by Djamaludin and Novikasari who found in their study that the average pain level in the first stage of parturition before the deep-breathing technique was given was 6, with deviation standard of 0.915. While the average pain level after the intervention of deep-breathing technique was given at the first stage of labor was 4, with deviation standard of 1.146. Pain is a unpleasant and subjective sensorial and emotional experience (Djunizar Djamaludin I, L.N, 2016). This experience is related to actual and potential tissue damages. Pain is usually defined in a term of tissue destructive processes such feelings as prickling, burning, twisting, emotion, fear, nausea, and intoxicated (Afroh F, 2012). Mothers lack knowledge of how to mitigate the pain during parturition process, and there are various methods of eliminating labor pain including their strengths and weaknesses (Puspitasari, 2017). Health professional need to provide health education during pregnancy examination, given that childbirth is supposed to be a pleasant experience, but not a few painful experiences for most women (S. Leethial, R.J.S, 2018).

#### **c. Difference in Pain Intensity in Intervention Group**

The results showed that the average pain level in the intervention group before the therapeutic intervention was 6.50 with a standard deviation of 1.167. While after the intervention, the average pain level was 3.80 with a standard deviation of 0.551. Therefore, the results of analysis show that there is a significant difference in the average pain levels before and after the intervention ( $P < 0.00, \alpha = 0.05$ ).

Therefore, there is a significant difference between the average pain levels in the first stage of childbirth in the intervention group before and after the intervention period given. Likewise, there was a significant difference between the mean pain levels in the control group before and after the intervention period. Although the results of both groups show significant differences in average pain levels between before and after a particular intervention given, there is a different in pain intensity scores shown by both group that is a difference of 6.50 and 3.80. This means that the average pain intensity from severe pain is controlled and

becomes mild. The results also showed that the average pain intensity in both groups was homogeneous. So that the decrease in pain intensity in women giving birth is really due to a combination of aroma therapy and back massage therapy. This is in accordance with the research finding by Seyyed and colleagues who showed the positive effects of aromatherapy and massage compared to the control group to reduce pain during childbirth (Seyyed-rasooli, A., 2016).

#### **d. The Effectiveness of the Combination of Aromatherapy Techniques and Back Massage on normal labor Pain intensity in Stage I of Active Phase**

The results of the difference in mean of pretest minus the mean of posttest pain levels in the intervention group were 2.70 and the control group was 0.73. The analysis found that there was a significant difference in the level of pain. The value of  $p < \alpha = 0.05$  shows that aroma therapy and back massage given to women giving birth at stage has a significant effect on the level of pain at stage I of active phase labor. Besides, there was a significant difference between the average pain levels in the control group. In brief, these results indicate that on average in both homogeneous groups, the decrease in pain intensity in women giving birth is really due to a combination of aromatherapy therapy and back massage.

Similarly, according to several studies, one of them was a study by Prima, lavender oil itself has a significant effect on reducing pain levels, increasing relaxation and drowsiness, as well as improving mood (Dewi, 2011). The physiological response to pain experienced by patients is when the pain impulses rise to the spinal cord leading to the brain stem and thalamus, the autonomic nervous system becomes stimulated as part of the stress response. Stimulation of the sympathetic branch of the autonomic nervous system produces a physiological response. If pain is continuous, gets severe, and involves visceral organs such as myocardial infarction, colic due to gallbladder, or kidney stones, the sympathetic nervous system produces an action. A study by Field and colleagues on twenty-eight women recruited from prenatal classes and randomly assigned to receive massage from their peers during breathing training technique which is learned during prenatal classes. Mothers who were massaged reported a decrease in depressive mood, anxiety and pain, and showed more positive influence activities following the first massage during labor. In addition, mothers who were given massage had shorter childbirth and experienced decreased depression (Field, T. 1997).

Based on the description on the results of the study above, the researcher believes that the decrease in pain intensity experienced by the study respondents occurred because respondents received aromatherapy relaxation technique and back massage therapy properly following the standard operating procedures. This treatment was done when the mothers start feeling moderate pain during their contractions. After that they were given inhaled aromatherapy and proper back massage which was done quietly and with focused at the same time. Getting that treatment, the patients felt calm, comfortable, relaxed, satisfied and seemed to be closer to the health workers who were serving them. This method is quite simple and inexpensive since it does not require a lot of equipment.

## **IV. Conclusion**

All women who give birth especially for the first time will experience increasing pain and anxiety. After a combined intervention of aromatherapy therapy and massage is given, the intensity of the pain will decrease. The combination of aromatherapy and back massage can increase the sense of comfort in pain management in nursing care for mothers who will

deliver normally. This can also be used as one of the ways in the action of pain adaptation to meet the basic need for pain relief which can improve health for both mother and fetus.

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