

Effect of sandalwood essential oil aromatherapy (*Santalum Album L*) on the intensity of labor pain reduction in the first stage at Elliani Silau Laut Clinic in 2023

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ABSTRACT

The traditional plant sandalwood is an essential oil producer because of its distinctive terrace wood properties and contains oil with a specific aroma. Essential oils contained in sandalwood are a class of sesquiterpenoid compounds including a-santalol and b-santalol. Sandalwood oil has functions including as an aromatherapy material that is very beneficial for human health. This type of research using the Quasy Experiment method with Case Control pretest posttest design, In this study the samples taken were 30 women in labor during the first stage. The sampling technique used total sampling. Statistical test results using the t-test paired sample test. Data analysis obtained is the intensity of labor pain during the first stage before giving sandalwood essential oil aromatherapy the majority experienced severe pain intensity as many as 16 respondents (53.3%) and 14 respondents (46.7%) in the moderate category. While the intensity of labor pain in the first stage after the administration of sandalwood essential oil aromatherapy, the majority experienced mild pain intensity as many as 18 respondents (60.0%), 10 respondents (33.3%) in the moderate category and 2 respondents (6.7%) in the severe category. The results of the analysis showed that the administration of sandalwood essential oil aromatherapy proved effective in reducing the intensity of labor pain during the first stage of labor.)

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INTRODUCTION

Childbirth is a physiological process or process of removing the results of conception that can live from the uterus to the outside world, thus allowing the mother to be able to give birth to her fetus through the birth canal (Bunga Tiara Carolin, 2021), According to the World Health Organization (WHO) the Maternal Mortality Rate (MMR) is still very high, around 810 women die from complications related to pregnancy and childbirth worldwide every day, and around 295 000 women die during and after pregnancy and childbirth. The maternal mortality rate in developing countries

reaches 462/100,000 live births. Meanwhile, in developed countries, it is 11/per 100,000 live births (Dian Pratiwi, 2020).

According to the results of the 2016 Indonesian Demographic and Health Survey (IDHS), the infant mortality rate (IMR) was 359/100,000 live births. Unresolved labor pain is one of the causes of prolonged partus and fetal death. Prolonged partus is the cause of maternal death in Indonesia with a percentage of 5% (Retno Anjani, 2019). Data released by the Directorate of Maternal Health in 2012 showed that maternal deaths in Indonesia were caused by several factors, including bleeding (30.1%), hypertension (26.9%), infection (5.6%), prolonged partus (1.8%), abortion (1.6%), and other causes (34.5%), based on these data, prolonged partus is one of the factors that contribute to maternal mortality in Indonesia, although with a fairly small percentage (Ratu, 2022).

Essential oils are complex mixtures of volatile alcohol compounds, and are produced as secondary metabolites in plants. Essential oils derived from sandalwood plants are obtained through direct steam distillation and steam from the logs, branches, and roots of sandalwood trees. Before distillation, the plant is given treatment such as sharpening with the aim of facilitating the release of oil (Ariyanti, M. Y. Asbur, 2018).

The traditional plant sandalwood is an essential oil producer because of its distinctive terrace wood properties and contains oil with a specific aroma. Essential oils contained in sandalwood are a class of sesquiterpenoid compounds including a-santalol and b-santalol. Sandalwood oil has functions including as an aromatherapy material that is very beneficial for human health. Rahayu et al. (2002) revealed that sandalwood oil can be used to cure stomach pain, skin pain, kidney infections, various inflammations, sedatives, drugs to reduce pain, and aromatherapy (Ariyanti, M. Y. Asbur, 2018).

Labor is the process of opening and thinning the cervix so that the fetus can descend into the birth canal. Scientifically, the birth of the baby and placenta from the uterus through a process that begins with uterine contractions that cause cervical dilation or widening of the mouth of the uterus. The process by which the baby, placenta and amniotic membrane come out of the mother's uterus (Irawati, Muliani, & Arsyad, 2019). Labor is the process of expelling the fetus that occurs in a full-term pregnancy, which is around 37-42 weeks, spontaneous birth with a back of the head presentation that takes place within 18 hours, without complications for both the mother and the fetus (Retno Anjani, 2019).

Several causes cause the onset of labor. A decrease in progesterone levels is an important factor affecting this process. Progesterone plays a role in relaxing the uterine muscles, while estrogen increases the vulnerability of the uterine muscles. In late pregnancy, progesterone levels decrease so that uterine contractions are known as "his." (Yanti, 2020). The oxytocin theory also has a significant role in the labor process. In late pregnancy, oxytocin levels increase, which causes contraction of the uterine muscles. The stretching of the uterine muscles also plays an important role in labor. The uterus will experience contractions as its muscles stretch due to fetal growth. As the pregnancy advances, the uterine muscles become more prone to contractions.

Influences from the fetus also affect the labor process. The hypophysis and suprarenal glands of the fetus also seem to have a role in this. In cases of anencephalus, the pregnancy often lasts longer than usual, suggesting that these factors contribute to the onset of labor. Finally, the prostaglandin theory becomes another important part in this process. Prostaglandins produced by decidua, the lining of the uterus, are thought to be one of the causes of the onset of labor. Experimental results show that prostaglandin F2 or E2 administered intravenously, intra, and extramurally can cause myometrial contractions at any stage of pregnancy.

RESEARCH METHOD

This study is a type of quasi-experimental research by applying Case Control pretest-posttest design. In this approach, the researcher has conducted a pretest in advance of the group that will receive

treatment, namely laboring mothers in the first stage at the Elliani Silau Laut Clinic in 2023. After that, treatment or treatment is given to the group. After the treatment is completed, a posttest is conducted to observe the changes that occur. The effect of the treatment can then be accurately analyzed by comparing the results of the pretest with the posttest.

The population in this study consisted of 30 laboring mothers in the first stage at the Elliani Silau Laut Clinic in 2023, and the sampling technique used was total sampling, which is taking the entire population that meets the inclusion criteria. Data were collected using questionnaire sheets and observation sheets as data collection techniques.

Data processing and analysis were carried out on two variables that were suspected of having a relationship or correlation in this study. The analysis was conducted using the t-paired sample test, which is useful for testing significant differences between pretest and posttest values. With this approach, researchers can identify the effect of treatment on changes in the intensity of labor pain in Stage I in more detail.

RESULTS AND DISCUSSIONS

Univariate Analysis

This study was conducted on all respondents in this study, namely 30 mothers in labor at time I at the Elliani Silau Laut Clinic in 2023. The frequency distribution of respondents' characteristics based on age, education, and parity can be seen in Table 1 below.

Table 1. Data on Respondent Characteristics at Elliani Silau Laut Clinic in 2023

No.	Demographic Data	Frequency	%
1	Age		
	≤20 yrs	5	16,7
	21-35 yrs	22	73,3
	>35 yrs	3	10,0
	Total	30	100
2	Education Level		
	Elementary School	0	0,0
	Junior High School	8	26,7
	HIGH School/Vocational School	18	60,0
	Diploma, Bachelor	4	13,3
	Total	30	100
3	Parity		
	Primiparous	18	60,0
	Multiparous	12	40,0
	Total	30	100

Table 1. shows data on the characteristics of respondents based on age, education and parity. Judging from the age of the majority of respondents aged 21-35 years as many as 22 respondents (73.3%), with the level of education of respondents is high school graduates as many as 18 respondents (60.0%), and seen from the parity of most primiparas as many as 18 respondents (60.0%).

The Intensity of Pain in Childbirth Period I Before Giving Aromatherapy Sandalwood Essential Oil (*Santalum Album L.*) at Elliani Silau Laut Clinic in 2023,

Data on the frequency distribution of labor pain intensity in the first stage before giving sandalwood essential oil aromatherapy (*Santalum Album L.*) at the Elliani Silau Laut Clinic in 2023 can be seen in table 2 below:

Table 2. Intensity of Pain in Childbirth Period I Before Giving Aromatherapy Sandalwood Essential Oil (Santalum Album L.) at Elliani Silau Laut Clinic in 2023

Labor Pain Intensity	Frequency	%
Mild pain (1-3)	0	0,0
Moderate pain (4-6)	14	46,7
Severe pain (7-10)	16	53,3
Total	30	100,0

Table 2 shows that the intensity of labor pain in the first stage before giving sandalwood essential oil aromatherapy, the majority experienced severe pain intensity as many as 16 respondents (53.3%) and 14 respondents (46.7%) in the moderate category.

Intensity of labor pain in the first stage after giving sandalwood essential oil aromatherapy (Santalum Album L.) at Elliani Silau Laut Clinic in 2023

Data on the frequency distribution of labor pain intensity during the first stage after giving sandalwood essential oil aromatherapy (Santalum Album L.) at the Elliani Silau Laut Clinic in 2023 can be seen in table 3 below:

Table 3. The intensity of labor pain in the first stage after giving sandalwood essential oil aromatherapy (Santalum Album L.) at the Elliani Silau Laut Clinic in 2023.

Labor Pain Intensity	Frequency	%
Mild pain (1-3)	18	60,0
Moderate pain (4-6)	10	33,3
Severe pain (7-10)	2	6,7
Total	30	100,0

Berdasarkan tabel 4.3 menunjukkan bahwa intensitas nyeri persalinan kala I sesudah pemberian aromaterapi kayu cendana essential oil mayoritas mengalami intensitas nyeri ringan sebanyak 18 responden (60,0%), 10 responden (33,3%) pada kategori sedang dan 2 responden (6,7%) pada kategori berat.

The Effect of Giving Aromatherapy Sandalwood Essential Oil (Santalum Album L.) on the Intensity of Decrease in First Period Labor Pain at the Elliani Silau Laut Clinic in 2023

Data analysis to determine the difference in the intensity of labor pain in the first stage before and after the administration of sandalwood essential oil aromatherapy used a t-test paired sample test. The results of the effect test can be seen in Table 4 below:

Table 4. Effect of Aromatherapy Sandalwood Essential Oil on the Intensity of Decrease in First Period Labor Pain

Pain Intensity Labor	n	Average	Average Difference	t- Count	p-value
- Before	30	6,77	3,2	18,232	0,000
- After	30	3,57			

Table 4. above shows the average decrease in the intensity of labor pain in the first stage before and after the administration of sandalwood essential oil aromatherapy which is 3.20 (mild pain category). These results indicate a decrease in the intensity of labor pain from severe to moderate to mild after the administration of sandalwood essential oil aromatherapy.

Based on the results of the pretest and posttest difference test using the paired sample t-test, it is known that the p value (0.000) $< \alpha$ (0.05) means that H_a is accepted, so it can be concluded that there is a significant difference in the intensity of labor pain before and after giving sandalwood essential oil aromatherapy. This means that the administration of sandalwood essential oil

aromatherapy is proven effective for reducing the intensity of labor pain in the first stage at the Elliani Silau Laut Clinic in 2023.

DISCUSSIONS

The intensity of labor pain before and after giving sandalwood essential oil aromatherapy (*Santalum Album L.*) at Elliani Silau Laut Clinic in 2023.

The results of the study before giving sandalwood essential oil aromatherapy, the majority of the intensity of labor pain during the first stage was in a severe category, namely 16 people and a minority of moderate pain as many as 14 people. Pain in labor is experienced mainly during contractions. Perceptions of the intensity of labor pain vary for each woman, usually described as the most extreme pain ever experienced. Pain is influenced by several physiological and psychological factors (Nurcahyani, et al., 2021).

Based on age characteristics, it is known that most are in the healthy reproductive age category, where with this healthy reproductive age the patient will be safer to face labor because the condition of the body's organs can physiologically respond well to the labor process, including in terms of effacement (thinning) and dilatation (opening) of the birth canal (cervix/portion) as well as a response to the onset of uterine contractions (HIS). Based on educational characteristics, most have a high school education. Based on theory, it is known that higher education is closely related to the information obtained, especially about childbirth, so it is hoped that with higher education the respondents will be able to manage pain well.

The Effect of Aromatherapy Sandalwood Essential Oil (*Santalum Album L.*) on the Intensity of Decrease in Pain of Childbirth Period I at Elliani Silau Laut Clinic in 2023

The results of bivariate data analysis showed an average decrease in the intensity of labor pain in the first stage before and after the administration of sandalwood essential oil aromatherapy, which was 3.20 (mild pain category). These results indicate a decrease in the intensity of labor pain from severe to moderate to mild after the administration of sandalwood essential oil aromatherapy.

Based on the results of the pretest and posttest difference test using the paired sample t-test, it is known that the p-value ($0.000 < \alpha (0.05)$) means that H_a is accepted, so it can be concluded that there is a significant difference in the intensity of labor pain before and after giving sandalwood essential oil aromatherapy. This means that the administration of sandalwood essential oil aromatherapy is proven effective for reducing the intensity of labor pain in the first stage at the Elliani Silau Laut Clinic in 2023.

Sandalwood oil is a very fragrant oil, therefore it is used as a binder for other fragrances (fixation) used in the perfume industry, and the results are mostly exported. According to Rahayu et al. (2002) revealed that sandalwood oil can be used to cure stomach pain, asthma, skin pain, kidney infections, various inflammations, sedatives, drugs to reduce pain, anti-cancer, anti-bacterial and aromatherapy (Ariyanti, 2018).

CONCLUSION

Research concluded that the use of sandalwood essential oil aromatherapy in the early stages of labor (kala I) at Elliani Silau Laut Clinic in 2023 significantly reduced pain intensity. Before aromatherapy, the majority of respondents experienced severe (53.3%) or moderate (46.7%) pain, but after aromatherapy, more than half of the respondents only felt mild pain (60.0%), while moderate pain was felt by 33.3%, and only 6.7% experienced severe pain. The results of statistical analysis showed a significant positive effect ($p < 0.05$) on pain reduction. Researchers recommend health workers, especially midwives, to integrate sandalwood aromatherapy as a non-pharmacological therapy in the management of labor pain in the first stage. This study is expected to provide guidance for future research as well as provide literature for students related to sandalwood aromatherapy therapy in

reducing pain in labor in the first stage. It is also recommended that future studies consider environmental factors and family support as well as parity in analyzing the effectiveness of sandalwood aromatherapy on labor pain.

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