Effect of lavender aromatherapy mask on anxiety in the first stage of labour

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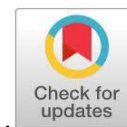
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ABSTRACT

The anxiety experienced by most maternity mothers arises because of fear of pain. During a pandemic, relaxation with lavender aromatherapy requires innovation. The purpose of this study was to analyze the effect of using lavender aromatherapy masks on anxiety in the first stage of labor. The design of this study was a true experiment with a randomized controlled clinical trial. The intervention group wore lavender aromatherapy masks with a 100% concentration dose content of 0.08 ml for 120 minutes. The study sampled 40 samples. The results of the study were that there was an effect of lavender aromatherapy masks on anxiety in the first stage of labor (p=0.000) with an effect size (d=1.319). Using a lavender aromatherapy mask can minimize the increase of anxiety during the first stage of labor.

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INTRODUCTION

Childbirth is a natural process that pregnant women go through to give birth to their babies. Factors that can interfere with the labor process, namely the strength and mental inadequate mother.[1] Based on Sutrisminah's research (2021) at Esti Husada Maternity Clinic in Semarang from September-October 2020, it is known that the anxiety levels of 22 maternity mothers with severe anxiety there are 5 mothers (22.7%), moderate anxiety in 13 mothers (59.1%) and mild anxiety 4 mothers (18.2%).[2] Based on a preliminary study conducted by researchers in Semarang City, it is known that 7 out of 10 maternity mothers experience severe anxiety during childbirth during the first stage of labor. Anxiety and worry experienced by most maternity mothers arise due to increased pain, tension, and fear of the pain of childbirth. The mental readiness of the mother in the face of labor is something that affects the smoothness of the labor process, so it is also important to do maternal care to overcome anxiety in maternity mothers.[3]

Anxiety can cause secretion of the hormone catecholamines and adrenaline which can result in a tense uterus that inhibits the mother's blood flow to the fetus and the effect can affect the fetal heartbeat and further increase pain.[4]Treatment of anxiety can be

through several efforts either pharmacologically with the administration of analgesic drugs and anesthesia or can be by the provision of non-pharmacological therapies such as relaxation techniques, warm compresses, hypnobirthing, acupuncture, acupressure, massage, and aromatherapy.5–8 Lavender aromatherapy is easier to apply than other therapies. The results of Karo's research (2017), showed that there was a significant effect of giving 10 ml of Lavandula angustifolia aromatherapy with a diffuser for 30 minutes on labor pain in laboring mothers with a p-value of 0.000 and a delta level of 40.88%. Lavender aromatherapy provides psychological effects such as relaxing and sedative effects on the body. The aroma of lavender can suppress the activity of the sympathetic nervous system. Volatile compounds can enter the bloodstream through the nose or mucous lungs, or directly diffuse into the olfactory nerve and pass through the limbic system which can affect the sympathetic nervous system.9

The use of aromatherapy can be in several ways and is most often applied, namely by using a diffuser. But currently, maternity mothers are required to use masks in the delivery room because of the COVID-19 pandemic. This pandemic has been a concern of the world community since the first outbreak was discovered in the city of Wuhan, China in late December 2019 until it finally spread to more than 200 countries including Indonesia. Globally based on data reported by the World Health Organization (WHO) until August 13, 2021, there were 205.338.159 positive confirmed cases including 4.333.094 deaths in it.[10] Indonesia is also one of the countries affected by COVID-19 where the death rate at the end of March 2020 reached 8.9%. Based on data from the Ministry of Health of the Republic of Indonesia until August 15, 2021, there were 3.854.354 positive confirmed cases and 117.588 of them died from COVID-19.[11]

Maternity mothers are among the vulnerable groups at risk of being infected with COVID-19 due to physiological, and psychological changes in the body and immune response mechanisms in the body. The main key to control and prevention against COVID-19 is compliance in implementing 5M behavior, one of which is compliance with the use of masks. So based on the guidance of the Public Ministry of Health (2020) while in the delivery room, mothers still need to wear masks during the delivery process so that there is no COVID-19 infection.[12]

The use of masks affects the smell of the mother in inhaling aromatherapy diffuser given to be not maximal. Ten out of ten maternity mothers said there was a strong difference in aromatherapy using a diffuser when wearing a mask and not. When wearing a mask the aroma is not so smelled maximal. Based on the results of research interviews with ten maternity mothers in Semarang City found eight mothers were happier with scented masks, especially lavender aromatherapy because according to the results of the interview it is known that most of the ten mothers are familiar with the aroma of lavender which is often used in mosquito repellent products. Lavender has a low toxic content and minimal allergies.[13]

Based on the results of organoleptic tests and pilot studies of researchers on 5 primigravid mothers, it was found that the dose of lavender aromatherapy on the mask was safe, comfortable, and effective to reduce anxiety and pain in maternity mothers when I, namely with a dose of 0.08 ml spread at four drops point. Departing from an existing background, then researchers will test the benefits of lavender therapy aromatherapy masks on anxiety in the first stage of labor. The purpose of this study was to analyze the effect of using lavender aromatherapy masks on anxiety in the first stage of labor.

METHOD

The design of this study was a true experiment with a randomized controlled clinical trial. The intervention group wore a lavender aromatherapy mask with a 100% concentrated dose of 0.08 ml for 120 minutes. The control group was given aromatherapy using a diffuser with 0.16 ml (4 drops) /200 ml of water for 120 minutes. The research sample was 40

samples. Each group consisted of 10 primigravid maternity mothers and 10 multigravid maternity mothers. The sample criteria in the study were mothers with severe and moderate anxiety. The measurement instrument of this study is NRS-Anxiety. Data analysis used Mann Whitney and Friedman Test followed by Post Hoc Wilcoxon. Ethics Permit Number from the Ethics Commission of Poltekkes Kemenkes Semarang 570/EA/KEPK/2021.

RESULTS

Table 1. Characteristics of Respondents

Characteristics	Group						p-value
	Intervention			Control			
	n	%	Mean±SD	N	%	Mean±SD	
Age			26,6±4,147			26,4±4,672	
<20 years old	0	0		0	0		
20-35 years old	20	100		20	100		0,496
>35 years old	0	0		0	0		
Gravida Statue			1,5±0,512			1,5±0,512	1
primigravida	10	50		10	50		
multigravida	10	50		10	50		
Work			1,25±0,444			1.15±0.366	
Not Working	15	75		17	85		0,122
Working	5	25		3	15		
Education			2,5±0,888			2,5±0,888	1
JHS	1	5		1	5		
SHS	12	60		12	60		
Academy D3	3	15		3	15		
Bachelor	4	20		4	20		
Weight	20	100	62,72±5,937	20	100	63,55±6,50	0,906
Height	20	100	158±1,747	20	100	158.6±1,847	0,430
Pain			8,450±0,759			8,575±0,674	
No Pain (0)	0	0		0	0		0,463
Mild (1-3)	0	0		0	0		
Moderate (4-6)	0	0		0	0		
Severe (7-10)	20	100		20	100		
Anxiety			6,800±1,056			6,850±1,136	
No Anxiety(0)	0	0		0	0		0,775
Mild (1-3)	0	0		0	0		
Moderate (4-6)	10	50		10	50		
Severe (7-10)	10	50		10	50		

Table 1. Levene's test is the result of Levene's test to determine the homogeneity of data variants. Statistically, the intervention and control groups had the same age variant, namely the productive age of the range of 20-35 years. Both groups had 10 (50%)

primigravid mothers and 10 (50%) multigravid mothers, who had a moderate anxiety level of 10 (50%) and a severe anxiety level of 10 (50%) respondents. Most of the respondents in the study did not work, it was known that in the intervention group 15 (75%) did not work and 17 (85%) respondents did not work in the control group. The majority of both groups had high school respondents as many as 12 (60%). The average weight and height of the two groups were also not much different. Based on table 1 it is known that all the measurable characteristics in this study have the same variant, evidenced by a significance value of $p \geq 0.05$ which means there is no difference in characteristics between the two groups being the subject of this study.

Table 2. Average of Anxiety

Anxiety	Intervention Group (n=20)		Control Group (n=20)	
	Mean±Sd	Min-Max	Mean±Sd	Min-Max
Before	6,800±1,056	5-9	6,850±1,136	5-9
After 30 minutes	5,450±1,146	3-8	6,600±1,242	4-9
After 60 minutes	5,475±1,070	4-8	6,775±1,241	4-9
After 120 minutes	5,650±0,988	4-8	7,150±1,268	4-9

Based on table 2 data, the average anxiety score before being treated in the intervention group of 6,800 (moderate anxiety), and the control group was also not far apart, which was 6,850 (moderate anxiety). The minimum value of both groups is the same, which is 5, and a maximum of 9. The score difference in 30 minutes to 5,450 in the intervention group and 6,600 in the control group. The intervention group after being given a lavender aromatherapy mask for 30 minutes can achieve a minimum score of up to 3. More clearly the decline can be observed in the following Figure 1.
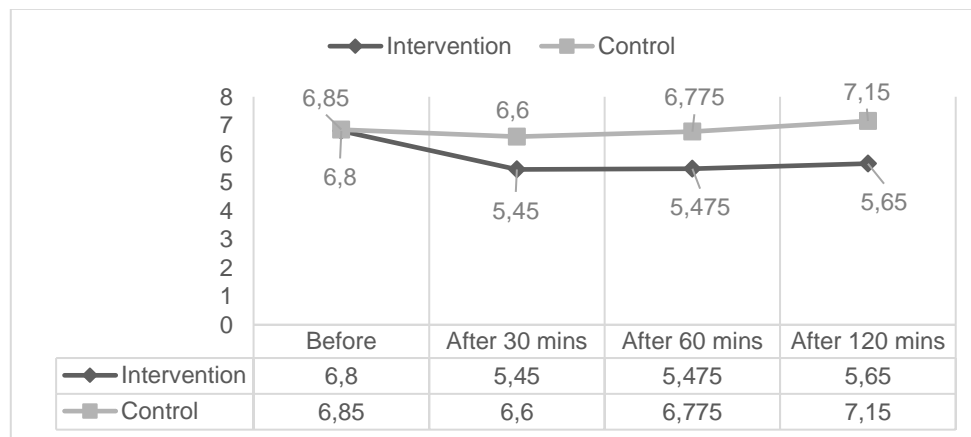

Figure 1. Average Difference Over Time

If observed figure 1 of the chart above shows the intervention and control group starting from the same anxiety score point, but there appears to be more decrease in the intervention group. The difference between the groups was 1.15 when given therapy for 30 minutes, a difference of 1.3 when given therapy for 60 minutes, and a difference of 1.5 when given therapy for 120 minutes. The graph illustrates the increase in anxiety over time, but the intervention group's anxiety score was lower than the control group's. This suggests the intervention group is better.

Table 3. Analysis of Differences in Anxiety Within Group

Group	Time	Mean Rank	P-*Value*
Intervention	Before	3,95	0,000
	After 30 minutes	1,93	
	After 60 minutes	1,90	
	After 120 minutes	2,23	
Control	Before	2,68	0,012
	After 30 minutes	1,98	
	After 60 minutes	2,38	
	After 120 minutes	2,98	

Based on Table 3, it is known that the value of significance obtained 0,000 < α 0,05 in the group given lavender aromatherapy masks so that thus it can be concluded that there are at least two different measurements. To find out which time measurement results are different, continued analysis with post hoc Wilcoxon.

Table 4. Differences in Anxiety Over Time

Time (I)	Time (J)	Intervention ΔMean	p-value	Control ΔMean	p-value
Before	After 30 mins	-1,35	0,000	-0,25	0,057
Before	After 60 mins	-1,325	0,000	-0,075	0,585
Before	After 120 mins	-1,15	0,000	0,3	0,154
After 30 mins	After 60 mins	0,025	0,655	0,175	0,059
After 30 mins	After 120 mins	0,2	0,102	0,55	0,007
After 60 mins	After 120 mins	0,175	0,059	0,375	0,026

Table 4. shows that wearing a lavender aromatherapy mask for 30 minutes, 60 minutes, and 120 minutes lowers anxiety. However, the use of a lavender aromatherapy mask from 30 minutes to 60 minutes has a p-value of 0,655>α 0,05 so it is concluded that it makes no difference, instead, there is an increase of about 0,025 which means 30 minutes is better than 60 minutes. The same was shown by data between 30 minutes and 120 minutes, as well as between 60 minutes and 120 minutes. Based on the results of post hoc analysis, there is no significant difference between the time of re-measurement, instead, there is an increase from the previous one. The same phenomenon also occurred in the control group that showed improvement over time although at the beginning when 30 minutes and 60 minutes of aromatherapy were given using a diffuser using a regular mask, anxiety scores decreased by 0,25 minutes to 30 and 0,075 minutes to 60. The comparison of average changes in anxiety reduction between the intervention and control groups was as follows.

Table 5. Analysis of Differences in Anxiety Between Group

Anxiety	Intervention Mean±Sd	Control Mean±Sd	ΔMean	p-value
Before	6,800±1,056	6,850±1,136	-0,50	0.837
After 30 mins	5,450±1,146	6,600±1,242	-1,15	0.004
After 60 mins	5,475±1,070	6,775±1,241	-1,3	0.001
After 120 mins	5,650±0,988	7,150±1,268	-1,5	0.000
Δ	1,150±0,709	0,700±0,571	0,45	0.028

Table 5. above showed before the intervention the mean anxiety score did not differ significantly (p= 0,837), while the intervention group's mean anxiety score looked significantly different from the control group at 30 minutes (p=0,004), i.e. the average anxiety score of the intervention group was lower by 1,15 than the control group. The same was seen from the statistical results at 60 minutes (p=0,001) that the difference in anxiety scores in the intervention group was lower by 1,3 than in the control group, and for the 120-minute administration time (p=0,000) there was also a difference of 1,5 lower than that of the control group. If we look at the difference in the difference in the anxiety score of the control group and the intervention then it is known that the difference is 0,45 better than the control group. Based on the results of the above statistics can be concluded there is a difference in the effectiveness of the use of lavender aromatherapy mask in maternity mothers during the first stage of labor with the administration of lavender aromatherapy concentration of 0,08% using a diffuser placed 60 cm next to the mother during the first stage of labor process to the anxiety with the treatment of 30 minutes, 60 minutes, or 120 minutes. When compared, it is known that giving for 120 minutes results in the largest difference between the giving time of 30 minutes and 60 minutes.

DISCUSSION

The purpose of this study was to look at the effect of using lavender aromatherapy masks to minimize increased anxiety. Statistically, this study explains that there is an average decrease in maternity maternal anxiety when wearing a lavender aromatherapy mask. The difference in anxiety scores before and the measurement time began to differ significantly after the use of 30 minutes (p =0,000), the initial average was 6,800 to 5,450 with the achievement of reducing anxiety to 3 (mild anxiety). So did the measurement after 60 minutes (p=0,000), to 5,475 and after 120 minutes (p=0,000), to 5,650. If seen in Figure.1 then we can see the phenomenon of increasing anxiety scores slowly starting from the measurement of 60 minutes. This is not due to failed intervention but to the increase in contraction of labor progress over time. This statement is reinforced by a graphical picture of the control group that also experienced the same phenomenon, even worse than the intervention group. There were no significant differences before and after the intervention in the control group. When 30 minutes (p = 0,057) only appeared to decrease 0,25, then when 60 minutes (p = 0,585) only appeared to decrease by 0,075, and when 120 minutes (p = 0,154) instead decreased there was an average increase in pain score of 0,3.

The results of this study showed there was a significant difference between the effectiveness of using a lavender aromatherapy mask and aromatherapy lavender diffuser against anxiety (p =0,028). Based on Table 4, the average difference in the anxiety group given a lavender aromatherapy mask is 1,150 with a standard deviation of 0,709 and the group given an aromatherapy intervention using a diffuser has an average difference of 0,700 with a standard deviation of 0,517. The difference on average between the two groups was 0,45, which means that the effect on anxiety was 0,45 greater in the group wearing lavender aromatherapy masks. Clinically known values Δ = 16,9% which means it has not appeared clinically effective. Although clinically wearing a lavender aromatherapy mask for 120 minutes is not effective, the effect size is large. The effect size of wearing a lavender aromatherapy mask for 120 minutes against anxiety was 1,319, which means the use of a lavender aromatherapy mask has a great effect on maternity anxiety during the first stage of labor. This study only measured its effect on maternal anxiety for 2 hours of use. Based on the organoleptic test, the mask can be used for 4 hours, so there is still a possibility of being clinically effective if continued for up to 4 hours. So far there have been no reports of adverse side effects for mothers when using lavender aromatherapy masks.

Based on Namazi's research (2014) it is known that the picture of anxiety in maternity mothers when can increase as labor progresses.[14] The response of the birth mother when not confident, uncomfortable, or faced with a threat there is a sense of anxiety

and fear that we call anxiety. Characteristics of mothers with moderate anxiety, namely the mouth feels dry, short-breathed, and sweaty. If it is heavy then there will be symptoms such as muscle tension and shortness of breath. In the central nervous system, this process involves cortical brain pathways - the reticular activation system of the limbic system (RAS) - the hypothalamus, which delivers impulses to the pituitary gland. An overactive autonomic nervous system can cause anxiety.[15–17]

Anxiety keeps the top order of cause of prolonged labor. The condition of a maternity mother who adapts to pain during labor, fear, and lack of confidence in her ability can create tension and hyperventilation. If not resolved anxiety can increase the pain that can affect the well-being of the mother and baby. Conversely, pain can also trigger the appearance of anxiety.[18] So the use of a lavender aromatherapy mask can help to manage anxiety.

The mechanism of working of lavender aromatherapy mask is the same principle as inhalation aromatherapy. When the nose inhales lavender aromatherapy in the mask, small molecules of aromatherapy substances will be passed to receptors (fine cilia) through the upper nasal cavity. It is then passed on to the olfactory nerve which sends aroma impulses to the limbic system. After that, the limbic system will activate the hypothalamus which will provide stimulation to the pituitary gland to secrete hormones related to feelings or emotions.[19] The sedative and relaxing effects convert beta brain waves into theta or gamma (subconscious conditions). At the time of theta or gamma brain waves, the brain produces the hormone serotonin, and endorphins and increases the activation of the body's parasympathetic nerve to be more comfortable and reduce anxiety.[20] The hormone serotonin which acts as a neurotransmitter will activate the pineal gland so that the production of the hormone melatonin increases to provide a sense of relaxation and stabilize emotions..[21]

The main ingredients of lavender are *linalool* and *linalyl acetate*. Linalool refers to two enantiomers of terpene alcohol that occur naturally and are often found in flowers and spices. There is a spicy sensation in this compound.[22] So when wearing a lavender aromatherapy mask the mother will feel a refreshing cold sensation in the eye area but not disturbed. *Linalool* is the main active content as a relaxation to reduce anxiety.[23] The advantage of lavender essential oil, when compared to other essential oils, is that it has relatively low toxicity and rarely causes allergies. The content of linalool and linalyl acetate has similar effects to benzodiazepines that act through the limbic system, especially the amygdala and hippocampus, which provide a sense of calm.[13]

CONCLUSION

Based on the results of the research and discussion above, it can be concluded that the use of a lavender aromatherapy mask with a 100% concentration dose content of 0.08 ml for 120 minutes. has an influence on the anxiety of mothers during the first stage of labor starting from use for 30 minutes and is still effective in providing benefits if used continuously. In addition to providing benefits to anxiety, this therapy also provides a refreshing sensation and its aroma makes the mother more comfortable using a mask.

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