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Research Article

The Impact of Aroma Therapy Variation on Reducing Pain and Anxiety Levels of Maternity Women

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Abstract: The level of labor pain is illustrated by the intensity of pain that is perceived by maternity women during labor. While Anxiety is a natural disorder or feeling that is marked by fear or anxiety that is deep and ongoing. Prenatal depression and anxiety often occur in maternal birth. One of the efforts made to overcome labor pain and reduce the level of anxiety is a non-pharmacological method. Aroma therapy of lavender (lavandula angustifiola) and pepper mint (mentha piperita) become options for non-pharmacological method. This study aims at investigating the impact of aroma therapy lavender and pepper mint in reducing labor pain and anxiety levels of maternity women in mother and child hospital of Siti Khadijah located in Kota Gorontalo. It uses a quasy-experimental design with non-equivalent control group administered by pre and post test. The populations are the total number of maternity women classified by inclusion and exclusion criteria. The samples are taken by using non-probability sampling method. Based on the result of the statistical computation using T-test, the result shows that there is not any significant effect of lavender and peppermint aroma therapy on reducing labor pain. The result of T-test is 2.042 and p value is 0.05, while for peppermint aroma therapy the result of T-test is 000 and p value is 0.1000. These results show that p value is higher than α 0.05. However, there is significant effect of lavender and peppermint aroma therapy on reducing anxiety level. The result of T-test is 6.056 and p value 0.000, while for peppermint aroma therapy the result of T-test is 14.4738 and p value is 0.000. This shows that p value is lower than α 0.05. Thus, it concludes that in term of reducing pain lavender and peppermint do not contribute significant effect but they are significantly effective in reducing anxiety level during labor.

Keywords: Labor Pain, Anxiety Level, Lavender and Peppermint Aroma Therapy.

INTRODUCTION

Labor pain usually begins at the first stage which is due to uterine contractions and cervical dilatation. The more increased the contractions both the length and frequency of uterine contractions, the more pain will be felt. The Association for the Study of Pain in Judha states that pain is an unpleasant emotional and sensory experience that arises from actual or potential tissue damage or indicates damage (Judha, 2012). Aromatherapy is a therapy that uses essential oils extracts to improve and maintain health, uplift our physic, and give freshness to our soul. The application of the aromatherapy lavender (lavandulaangustifiola) method and pepper mint (menthapiperita) are non-pharmacological methods that can reduce labor pain.

Joulaeerad *et al.*, (2018) suggested that the content of pepper mint (menthapiperita) was significantly able to overcome the nausea of vomiting in trimester one suffered by pregnant women, but there have been no recent studies that prove that Pepper mint (menthapiperita) can reduce anxiety in maternity. Scientific evidence shows that lavender aromatherapy slows nerve activity, improves sleep quality, relaxes, and mood in patients who experience pain complaints (Joulaeerad *et al.*, 2018).

In Gorontalo Province the method of providing lavender aromatherapy (lavandulaangustifiola) and pepper mint (menthapiperita) in hospitals and health centers has not been applied to patients. Thus, the researchers chose aromatherapy lavender (lavandulaangustifiola) and pepper mint

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(menthapiperita) as a non-pharmacological way to reduce labor pain and anxiety levels.

Based on the observation, the researchers considered that it necessary to conduct research related to the administration of aromatherapy lavender (lavandulaangustifiola) and pepper mint (menthapiperita) to reduce pain in labor and the level of anxiety. Eventually, it can provide comfort and relaxation to the pregnant women at the time of childbirth.

METHODOLOGY

This research uses a quasi-experimental design with nonequivalent control group given pre and posttest. The treatment group and the control group were selected non-randomly, then, before and after the treatment the measurements of the two groups were carried out. The population are all maternal women in the mother and children hospital of Siti Khadijah who are classified into inclusion and exclusion criteria. The sampling technique uses nonprobability sampling technique (Creswell, 2014).

RESULTS

Univariate Analysis

Table 1. Frequency of distribution of the Pain of respondents before and after the administration of lavender aromatherapy

Pain Level	Frequency Before	Percentage %	Frequency After	Percentage %
Mild	0	0	0	0
Moderate	5	25	9	45
Severe	15	75	11	55
Total	20	100	20	100

Source: Primary Data Analysis (2019)

Table 1 shows that before lavender aromatherapy given, there was 0 (0%) respondent with mild pain category, while those who experienced moderate pain were five respondents (25%) and those who experienced severe pain accounted for 15 respondents (75%). The results concluded that a large size of respondents were experienced labor pain in the category of severe pain before the intervention of lavender aromatherapy. After lavender aromatherapy was administered, there were changes in the level of labor pain. From 15 respondents (75%) with the category of severe pain reduced to 11 respondents (55%).

Table 2. Frequency Distribution of Respondents Pain Before and After Giving Peppermint Aromatherapy

Pain Level	Frequency Before	Percentage %	Frequency After	Percentage %
Mild	0	0	3	15
Moderate	7	35	4	20
Severe	13	65	13	65
Total	20	100	20	100

Source: Primary Data Analysis (2019)

Table 2 shows that before papomint aromatherapy given, there was 0 (0%) respondent with mild pain category, while those who experienced moderate pain were seven respondents (35%) and those who experienced severe pain categories were 13 respondents (65%). After giving pappermint aromatherapy, there were three respondents who experienced a decrease in labor pain, seven respondents who were initially in the category of moderate pain decreased to four. However, this is different from the severe pain category which did not decrease in labor pain both before and after the intervention of lavender aromatherapy.

Table 3. Frequency Distribution of Anxiety Levels of Respondents Before and After Giving Aromatherapy Lavender

Anxiety Level	Frequency Before	Percentage %	Frequency After	Percentage %
None of Anxiety	3	15	14	70
mild	8	40	5	25
moderate	7	35	1	5
severe	2	10	0	0
Panic	0	0	0	0
Total	20	100	20	100

Source: Primary Data Analysis (2019)

Table 3 shows that before lavender aromatherapy was given, there were three respondents (15 in the category of no anxiety, mild were eight respondents (40%), moderate were seven respondents (35%) and severe were two respondents (10%) respectively. After lavender aromatherapy was administered, there was a change in anxiety level. None of respondents experienced severe anxiety (0%), only one respondent who experienced moderate anxiety (5%) and five respondents experienced mild anxiety (25%). In addition, the majority of respondents did not experience anxiety accounted for 14 respondents (70%).

Table 4. Frequency Distribution of Respondents Anxiety Levels Before and After Giving Pappermint Aromatherapy

Anxiety Level	Frequency Before	Percentage %	Frequency After	Percentage %
None of Anxiety	0	0	17	85
Mild	7	35	2	10
Moderate	5	25	1	5
Severe	8	40	0	0
Panic	0	0	0	0
Total	20	100	200	100

Source: Primary Data Analysis (2019)

Table 4 shows that the majority of respondents experienced a severe anxiety accounted for eight respondents (40%). Then, there were five respondents (25%) who experienced moderate anxiety, seven respondents (35%) experienced mild anxiety and 0 (0%) respondents who had no anxiety respectively. After giving pappermint aromatherapy, there was a change in anxiety level. There was no respondent who experienced severe anxiety (0%), one respondent experienced moderate anxiety (5%) and two were mild anxiety (10%). Further, the majority of respondents experienced a decrease in none of anxiety level that was 0 to 17 respondents (85%) experienced no anxiety after using pappermint aromatherapy.

Bivariate Analysis

1. Lavender Aromatherapy

Table 5. T-Dependent Tests of Labor Pain seen by before and after the intervention of Lavender Aromatherapy

	Labor Pain					
	N	***Mean***	***Mean Difference***	***SD***	***T***	***P-value***
Before	20	7.3000	0,6000	1.21828	2.042	0.050
After	20	6.7000		1.38031		

Source: Primary Data Analysis (2019)

Table 5 shows that the average labor pain before giving lavender was 7,300 with a standard deviation 1,218. Then, after being given lavender it increased to 6.7000 with a standard deviation 1,380. Paired simple t-test results obtained a t value. 2,042 with p- value 0.05. It shows that p-value 0.055 was higher than α (0.05). Thus, Ho is accepted which means there is no significant difference in labor pain before and after the intervention of lavender.

Table 6. T-Dependent Tests of Anxiety Levels seen by before and after the intervention of Lavender Aromatherapy

	Anxiety Level					
	N	***Mean***	***Mean Difference***	***SD***	***T***	***P-value***
Before	20	18.8500	7.0500	7.08798	6.056	0.000
After	20	11.8000		4.14983		

Source: Primary Data Analysis (2019)

Table 6 shows that the average level of anxiety in giving birth before the intervention of lavender was 18.8500, then after intervention was 11.8000. Paired simple t-test analyzed that the t value was 6.056 with a p-value accounted 0.000. It also shows that p-value 0.000 was lower than α (0.05) which meant Ho was rejected. Thus, there was a significant difference in the level of anxiety of respondents before and after lavender was given.

2. Pappermint Aromatherapy

Table 7. T-Dependent Test of Labor Pain seen by before and after the intervention of Peppermint Aromatherapy

	Pain Level					
	N	***Mean***	***Mean Difference***	***SD***	***T***	***P-value***
Before	20	6.8500	0000	1.66307	000	0.1000
After	20	6.8500		2.23077		

Source: Primary Data Analysis (2019)

Table 7 shows that the average of labor pain before the intervention of pappermint was 6.8500 while after that became 6.8500. Paired simple t-test obtained t value accounted for 000 with p-value was 0.1000 which was higher than α (0.05). Thus, it shows that Ho was received and there is no significant difference in labor pain level before and after the intervention of peppermint.

Table 8. T-Dependent Tests for Anxiety Level seen by before and After the Intervention of Peppermint Aromatherapy

	Anxiety Level					
	N	***Mean***	***Mean Difference***	***SD***	***T***	***P-value***
Before	20	24.7500	14.800	7.34757	14.738	0.000
After	20	9.9500		5.65197		

Source: Primary Data Analysis (2019)

Table 8 concludes that the average level of anxiety before the intervention of pepermint was 24,7500 while after that became 9,9500. Paired simple t-test shows the t value was 14.4738 with a p-value accounted for 0.000 which was lower than α (0.05). Thus, it shows that Ho was rejected which means there is a significant difference in maternal anxiety level before and after peppermint intervention.

3. Difference in Labor Pain of the Two Groups between the Intervention of Lavender and Peppermint

Table 9. T-Independent Test of Difference in Labor Pain between the Lavender Group and the Peppermint Group

	Pain Level					
	N	***Mean***	***Mean Difference***	***SD***	***T***	***P-value***
Lavender	20	6.7000	-0.150	1.38031	-0.256	0,800
Pappermint	20	6.8500		2.23077		

Sumber: olahah data primer (2019)

Table 9 shows that the results of statistical computation using t-independent test was the average of labor pain in the lavender group was 6.70 with a standard deviation accounted for 1.380 while in the peppermint group, the average of labor pain was 6.85 with a standard deviation accounted for 2.231. Statistical test obtained P-value which was 0.800 so that it can be concluded that there is no significant difference between the average value of labor pain performed by lavender and peppermint groups.

4. Difference in anxiety level of two groups between the intervention of Lavender and Peppermint

Table 10 T-Independent Test of Difference in Anxiety Level between the Lavender Group and the Peppermint Group

Anxiety Level						
	N	***Mean***	***Mean Difference***	***SD***	***T***	***P-value***
Lavender	20	11.8000	1.850	4.14983	1.180	0.245
Pappermint	20	9.9500		5.65197		

Sumber: olahah data primer (2019)

Table 10 shows the results of t-independent test was the average level of anxiety in the lavender group was 11.80 with a standard deviation accounted for 4.150 while in the peppermint group, the average level of anxiety was 9.95 with a standard deviation accounted for 5.652. The statistical test obtained P-value was 0.245. It can be concluded that there is no significant difference between the average value of level of anxiety performed by lavender and peppermint groups.

DISCUSSION

The result of frequency distribution in the administration of lavender aromatherapy was there were 4 respondents (20%) who experienced a decrease in labor pain. They experienced severe labor pain but after they were given lavender aroma therapy they experienced moderate pain. However, the statistical computation showed that the average value of the difference between before and after lavender aroma therapy administered was only 0.60 with p value accounted for 0.050 which means that there was no significant effect of lavender aroma therapy on reducing labor pain.

The result of frequency distribution in the administration of peppermint aromatherapy was there were 3 respondents (15%) who experienced a decrease in labor pain. They experienced moderate pain but after they were given peppermint aroma therapy they experienced mild pain. However, the statistical computation showed that the average value of the difference between before and after peppermint administered was 0.00 with p value accounted for 0.100 which means that there was no significant effect of peppermint aroma therapy on reducing labor pain.

Based on the results above, the administration of lavender and peppermint aromatherapy has no effect in reducing labor pain. This is in accordance to research conducted by Yazdhakasti and Pirak on "The effect of aromatherapy with lavender essence on severity of labor pain and duration of labor in primiparous women" which shows that the administration of lavender aromatherapy in labor can reduce labor pain, evidenced by the P-value of 0.00. However, there is no significant difference between the duration of the active phase in intervention group and the control group (Yazdkhasti & Pirak, 2016)

There are several factors affect labor pain such as age, parity, coping mechanisms, relaxation methods used, fatigue, length of labor, anxiety and fear, and maternal or fetal position. When it is seen from the parity factor there are 25 respondents (62.5%) who are primipara (women who are successfully have childbirth once). The cervix in multiparous women (women who experienced childbirth more than once) experiences softening before the onset of labor. However, this is not the case in the cervix in primiparous women which causes more pain for them and more severe than multipara experienced. The intensity of uterine contractions that are felt in primiparous is greater than multipara, especially at the end of the first stage and the beginning of the second stage of labor. In addition, in primiparous women this labor is their first experience, so that thay find it difficult to do coping mechanisms on themselves. Every human has his own way of dealing with stress due to pain he/she experienced. But when pain becomes a threat to individual it will be difficult to control his/her pain (Yuliatun, 2008).

Another factor that causes aromatherapy lavender and pappermint has no effect on reducing labor pain is the characteristics of respondents with varying cervical openings. There are 10 respondents (25%) with cervical opening 7-8 cm. At the beginning of the first stage, the pain is visceral, caused by uterine contractions and ervical dilatation that is innervated by sympathetic afferent fibers and transmits the spinal ducts in the T10-L1 segment (thoracal 10-Lumbar 1) through delta nerve fibers and syafar C fibers originating from the spinal cord in the T10-L1 segment (thoracal 10-Lumbar 1) through delta nerve fibers and syafar C fibers originating from the walls of the spinal cord in the T10-L1 segment (thoracal 10-Lumbar 1) from lateral and uterus. However, at the opening of the cervix 7-8 cm has entered the phase transition stage I to stage II. During the transition phase, women will usually feel a sensation of extreme pain. Expressions appear helpless and show a decreased ability to hear and concentration, so that the labor pain scale increases 2-3 scale.(Maryunani, 2010)

The results of the frequency distribution in the administration of lavender aromatherapy showed that all respondents (100%) experienced a decrease in the level of anxiety in labor. This is evidenced by the results that the difference in the average decrease in anxiety levels before and after the intervention of lavender aromatherapy is 7.05 with a P-value accounted for 0.00 so that it can be concluded that there is a significant effect of aromatherapy lavender therapy on anxiety levels. Similar to lavender, peppermint also obtained the results of the frequency distribution showed that all respondents (100%) experienced a decrease in the level of anxiety in labor. This is evidenced by the results that the difference in the average decrease in anxiety levels before and after the intervention of pappermint is 14.80 with a P-value accounted for 0.00 so that it can be concluded that there is a significant effect of peppermint on anxiety levels.

Basically, the mechanism of reducing anxiety levels in both maternal women in lavender and papermint group is almost the same. Giving lavender and peppermint aromatherapy provide comfort effects and increase body relaxation so that it improves the psychological conditions that reduce pain in labor. The more comfort and relax the body the more anxiety reduced. Scientific evidence shows that lavender aromatherapy slows nerve activity, improves sleep quality, relaxes, and improves mood in patients who experience pain complaints (Özkaraman, Dügüm, Yılmaz, & Yeşilbalkan, 2018).

Lavender has a lot of potential essence such as monoterpenehydrocarbons, camphene, limonene, geraniol lavandulol, nerol and mostly contains linalool and linalool acetate with an amount of about 30-60% of the total weight of oil. Linalool is the main active ingredient as a relaxation to reduce anxiety(Malcolm & Tallian, 2017). While, mint oil has a high content of the menton and menthol compounds. Mint leaves are also effective for controlling depression because it can stimulate the nervous system and provides an antidepressant effect (Jaelani, 2009).

If aromatherapy enters the nasal cavity through direct inhalation, it will work faster because essential oil molecules are easily evaporated by the hypothalamus. It is processed and converted by the body into an action by releasing neurochemical substances in the form of endorphins and serotonin and it directly affects the olfactory organ and are perceived by the brain to give reactions that make physiological changes in the body, mind, soul and produce a calming effect on the body(Kartika *et al.*, 2015).

Based on the results of t-independent test, the reduction in labor pain during 10 minutes of lavender and peppermint aromatherapy in both two groups are not significant. The result was that the average of labor pain in the lavender group was 6.70 with a standard deviation accounted for 1.380 and in the peppermint group the average labor pain was 6.85 with a standard deviation accounted 2.231. Statistical test results obtained a P-value was 0.800, it can be concluded that there is no significant difference between the average difference in labor pain performed by giving lavender and peppermint aromatherapy.

Lavender and peppermint aromatherapy are used as alternatives for massage or inhalation, which are quickly absorbed into the bloodstream and excreted from the body through the kidneys and liver and Co2 is exhaled. The mechanism of aromatherapy in the human body takes place through the body's circulation and olfaction systems (Safaah, 2019). The results proved that lavender and peppermint given for 10 minutes can reduce the level of pain experienced by respondents. It can be seen from the level of pain before intervention in the lavender and peppermint groups are in the category of severe pain. After the intervention given to both group, the lavender group performed severe pain before reduced to moderate pain. While the peppermint group performed severe pain to mild pain.

Lavender is one type of aromatherapy containing 8% terpene and 6% ketone. Monoterpene is the type of terpene compound most often found in plant essential oils. In medical applications monoterpenes are used as sedatives. Lavender oil also contains 30-50% linalil acetate, an ester compound that is formed by combining organic acids and alcohols. Esters are very useful for normalizing emotional states and unbalanced body states, and also have properties as a sedative and tonic, especially in the nervous system. The fragrance produced by lavender aromatherapy will stimulate the thalamus to release encephaline, functioning as a natural painkiller. Enkefalin is a neuromodulator that functions to inhibit physiological pain(Alexa *et al.*, 2018).

Further, peppermint aromatherapy contains menthol which functions as a mild anesthetic that is temporary and effective as one of the anti-convulsion and spasmolytic mechanisms in vitro in skeletal muscles, making it suitable when used in complaints of pain in bones, smooth muscles of the gastrointestinal tract and bile ducts. The content of menthol (cold sensation) is more effective when used as a muscle relaxant by smearing it, because menthol absorbs more quickly through the skin, and is able to reduce athletic injury, muscle aches, menstrual cramps and various digestive problems including bloating, nausea, morning

sickness, and stomach cramps. The content of menthol is only temporary when given by inhalation, but is more effective when used for massage (Kligler & Chaudhary, 2007).

Research Conducted by Chan et.al (2019), Aromatherapy is effective in reducing labor pain and duration, and generally safe to the mothers. However, due to the heterogeneity across trials in some of the outcomes, further trials with device-based pain measurements, larger sample sizes, and more stringent designs, should be conducted before strong recommendations(Chen *et al.*, 2019).

T-test independent shows that the average level of anxiety in the lavender group was 11.80 with a standard deviation accounted for 4.150 and in the peppermint was 9.95 with a standard deviation accounted for 5.652. The statistical test results obtained a P-value was 0.245, it concluds that there is no significant difference between the average value of the level of anxiety performed by giving lavender and peppermint aromatherapy.

This study discusses the research conducted by Ozkaraman et.al (2018) in cancer patients who support chemotherapy, State anxiety before and after chemotherapy did not vary among groups. The authors compared trait anxiety values before and after chemotherapy and found a significant difference in the lavender group. In addition, a significant change in PSQI measurements before and after chemotherapy was observed (Özkaraman *et al.*, 2018). Aromatherapy is one alternative relaxation method that provides a feeling of calm. In the lavender and peppermint group before the intervention the level of anxiety was in severe level, and after being given an intervention in the lavender and peppermint group it reduced into the category of no anxiety. The positive impact of aromatherapy on reducing anxiety levels will be more felt when it is given directly inhalation because the nose has direct contact with the parts of the brain that are tasked with stimulating the effects of aromatherapy.

Basically the way lavender and peppermint aromatherapy works are similar. It stimulates the olfactory nerve cells and affect the limbic work system. The limbic system is central to pain, pleasure, anger, fear, depression and various other emotions including anxiety. The hypothalamus which acts as a relay and regulator raises messages to other parts of the brain and body. The message received is then converted into action in the form of the release of the hormones melatonin and serotonin which cause euporia, relaxes or sedatives(Prasastiwi, 2018).

The main content of lavender is linalyl acetate and linolool which is the main active ingredient that plays a role in reducing anxiety, while aromatherapy in the form of peppermint oil is made from mint (mentha piperita) has a high menthol content. This essential oil contains menthol (7-48%)(Balakrishnan, 2015). The benefits of aromatherapy are fostering a feeling of calm (relax) in the body, mind and spirit, creating a peaceful atmosphere, and can keep away from feelings of anxiety and anxiety.

Aromatherapy gives rise to a fresh perception, relaxation and comfort for patients. This condition can suppress stress stimulation which causes the body to feel comfortable. Research conducted by Arwani (2013) on the effect of giving aromatherapy to the patient's anxiety level before surgery showed that there was an influence of giving aromatherapy to the patient's anxiety level before surgery with spinal anesthesia at Tugu Hospital Semarang. According to Arwani aromatherapy has a positive effect because a fresh and fragrant aroma will stimulate sensory and receptors which ultimately affect other organs so that it can have a strong effect on emotions and be able to react to stress. Aromatherapy has several advantages as a supportive action such as to reduce anxiety and depression(Arwani, 2013).

Research conducted by Ayik et.al (2018) with the title *"The effects of preoperative aromatherapy massage on anxiety and sleep quality of colorectal surgery patients: A randomized controlled study",* Results There was no baseline difference between the groups. A statistically significant difference was found between the experimental and control group in terms of the SAI and RCSQ mean scores recorded on the morning of surgery. It was determined that the SAI and RCSQ mean score of the experimental group after aromatherapy massage on the morning of surgery decreased when compared to that of the evening before surgery. Conclusions It was found that aromatherapy massage with lavender oil increased the sleep quality and reduced the level of anxiety in patients with colorectal surgery in the preoperative period(Ayik & Özden, 2018).

CONCLUSION

The conclusions are (1). There is no effect of lavender and peppermint aromatherapy on labor pain (2). There is a significant effect of lavender and peppermint aromatherapy on the level of anxiety in maternity.

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