

Effectiveness of Lavender (*Lavandula angustifolia*) and Jasmine (*Jasminum officinale*) Aromatherapy on the Intensity of Dysmenorrhea in Student of Faculty of Public Health, Universitas Nusa Cendana, Kupang

Maria Antonia Nurak¹⁾, M. Dinah Charlota Lerik²⁾,
Paula Tibuludji²⁾, Muntasir²⁾, Refli²⁾

¹⁾Masters Program in Public Health Sciences, Universitas Nusa Cendana, East Nusa Tenggara

²⁾Faculty of Public Health, Universitas Nusa Cendana, East Nusa Tenggara

ABSTRACT

Background: Dysmenorrhea is a menstrual cramp that in general occurs in adolescents. In Indonesia the figure of dysmenorrhea is estimated at 64.25%. Students who experience dysmenorrhea will greatly disrupt learning activities and absence on campus. Lavender and jasmine aromatherapy has benefits for reducing dysmenorrhea because it contains linanool. One of the methods to decrease the dysmenorrhea is namely lavender aromatherapy and jasmine aromatherapy. The purpose of this study was to determine differences of the effectiveness of lavender aromatherapy and jasmine aromatherapy towards the intensity of dysmenorrhea.

Subjects and Method: This was a quasi-experiment without control group. The study was conducted at the Postgraduate Clinic of Universitas Nusa Cendana, from March to April 2020. The study population was the students of the Faculty of Public Health, Universitas Nusa Cendana year 2019. A sample of 40 students was selected by purposive sampling. The dependent variable was dysmenorrhea. The independent va-

riables were lavender and jasmine aromatherapy. Dysmenorrhea was measured by Numerical Pain Rating Scale. The data were analyzed by t test.

Results: After receiving lavender and jasmine aromatherapy, intensity of dysmenorrhea in lavender aromatherapy (Mean=19,50 ; SD=0,48) was lower than jasmine aromatherapy (Mean=21.50 ; SD=0.51), but it was statistically non-significant (p= 0.524).

Conclusion: Lavender and jasmine aromatherapy have similarly effect in intensity of dysmenorrhea.

Keywords: lavender aromatherapy, jasmine aromatherapy, dysmenorrhea.

Correspondence: Maria Antonia Nurak. Masters Program in Public Health Sciences, Universitas Nusa Cendana, East Nusa Tenggara, Indonesia. Jl. Adi Sucipto Penfui Lasiana, Klp. Lima, Kota Kupang, Nusa Tenggara Tim 85001. Email: anurmaria10@gmail.com Mobile: 0813-53242041

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BACKGROUND

The most prevalent menstrual problem experienced by adolescents is dysmenorrhea. Dysmenorrhea is a symptomatic phenomenon which characterized by abdominal pain, cramps and lower back pain (Kusmiran, 2014). Data from WHO in 2014 revealed that 1,769,425 people (90%) of women expe-

rienced dysmenorrhea, 10-15% of them experienced severe dysmenorrhea. The incidence of dysmenorrhea in Indonesia is 64.25% consisting of 54.89% experiencing primary dysmenorrhea and 9.36% experiencing secondary dysmenorrhea (Larasati and Alatas, 2016). The impact of dysmenorrhea on school age adolescents, including decreases

concentration in the academic field and learning system (Osayande & Mehulic, 2014).

Dysmenorrhea causes absence from work and school as many as 13-15% of women who have been absent once and 5-14% repeatedly absent. In addition, dysmenorrhea can interfere with social activities of adolescent (Azurah, 2013). Dysmenorrhea can be managed in two ways, pharmacological and non-pharmacological. Pharmacological therapy by providing analgesic drugs which can provide side effects. Non pharmacological therapy has the advantage of being inexpensive and easy to apply anywhere, including at home. One of these non-pharmacological treatments is aromatherapy which able to reduce the level of pain (French, 2014).

The application of aromatherapy through inhalation, where the receptor cells in the nose stimulated and impulses are transmitted through the olfactory tract to center of emotional of the brain or limbic system, where it will stimulate the hypothalamus to release endorphine and serotonin hormones. The endorphin function as natural pain killer, while serotonin improves the mood, relax and calm (Nugroho & Utama, 2014). The aromatherapy used in this research was lavender aromatherapy and jasmine aromatherapy, they are the most popular and safe aromatherapy. The lavender aromatherapy and jasmine aromatherapy have an effect on decreasing the intensity of dysmenorrhea (Laila, 2011).

This is because both lavender and jasmine contains Linalool. Linalool is the main active chemical components which directly affect the limbic system that provide the effect of relaxation, calm, and reducing the intensity of pain during menstruation (Solehati & Kosasih, 2015).

Nurak et al. (2015) reported that the mean score for reducing dysmenorrhea in the lavender aromatherapy group was (10.50) and in the deep breath relaxation group (30.50). This study has a significant differ-

ence in effect with a value of $p < 0.001$. This proves that lavender aromatherapy was more effective than relaxing deep breaths in reducing dysmenorrhea.

Sari (2015) reported that the results obtained before being given jasmine aromatherapy were 62.5% moderate pain and 37.5% severe pain and after being given jasmine aromatherapy, 31.2% experienced no pain, 56.2% experienced mild pain and 12.5% had moderate pain. This proves that there was an effect of jasmine aromatherapy on reducing dysmenorrhea scales in adolescents at SMAN 2 Pontianak. The purpose of this research was to determine the differences in the effectiveness of lavender aromatherapy and jasmine aromatherapy on the intensity of dysmenorrhea on students at the Faculty of Public Health, Universitas Nusa Cendana.

SUBJECTS AND METHOD

1. Study Design

This was a quasi experiment study with no control group. The study was conducted at the Postgraduate Clinic of Universitas Nusa Cendana, from March to April 2020.

2. Population and Sample

The study population was 240 female students. A sample of 40 female students was divided into two groups. The study subjects were selected by purposive sampling.

3. Study Variables

The dependent variable was intensity dysmenorrhea. The independent variables were lavender and jasmine aromatherapy.

4. Operational Definition of Variables

Aromatherapy was lavender or jasmine oil that provides a relaxing effect for pain by using inhalation techniques i.e. by inhaling lavender oil that has evaporated 4-5 drops into water 10 ml for 10 minutes at a time.

Dysmenorrhea was pain that occurs during menstruation that can interfere with daily activities as well as pain that occurs on the first day of menstruation and the second day

and without the abnormality of the reproductive organs.

5. Study Instruments

Dysmenorrhea was measured by Numerical Pain Rating Scale, this tool uses certain colors and codes to facilitate the understanding of respondents, with vulnerable images numbers 1-10. No pain : 0, Mild pain:1-3, Moderate pain:4-6, and Severe pain :7-10.

6. Data Analysis

Before analyzing the data first test thenormality of the data. The normality test results the data uses based on the pre-test and post-test values have a value ($p < 0.05$) which means the menstrual pain data of both distributed groups is abnormal. Wilcoxon's test aims to determine the effect of lavender aromatherapy and jasmine aromatherapy on dysmenorrhea by analyzing the dysmenorrhea decrease in scores before and after the intervention of lavender aromatherapy and jasm

ne aromatherapy. Mann Whitney's trial aims to compare lavender aromatherapy group interventions and jasmine aromatherapy against dysmenorrhea.

7. Research Ethics

Research ethical issues including informed consent, anonymity, and confidentiality, were addressed carefully during the study process. The research ethical clearance approval letter was obtained from the the Nusa Cendana Kupang University medical faculty health research ethics commission on March 9, 2020 with Number: U N 0 2 2 0 0 2 1 0.

RESULTS

1. Sample Characteristics

Table 1 showed that the lavender aromatherapy group and the jasmine aromatherapy group are mostly 19 years old (70%) and (60%).

Tabel 1. Characteristics of respondents by age in the lavender and jasmine aromatherapy group at the Faculty of Public Health (n = 40)

Variabel	Characteristic	Category	n	%
Lavender Aromatherapy	Age	18 years old	6	30%
		19 years old	14	70%
Jasmine Aromatherapy	Age	18 years old	8	40%
		19 years old	12	60%

2. Bivariate analysis

Table 2 showed, intensity of dysmenorrhea was decreased after lavender aromatherapy intervention (mean=2.35 ; SD=0.48) and it was statistically significant ($p < 0.001$). Table 3 showed, intensity of dysmenorrhea was decreased after jasmine aromatherapy intervention (mean=2.45 ; SD= 0.51) and it was statistically significant ($p < 0.001$).

Table 4 showed intensity of dysmenorrhea was reduced with lavender aromatherapy (mean=19.50 ; SD=0.48) and jasmine aromatherapy (mean=21.50; SD= 0.51), there was no statistically significant difference in effectiveness between lavender and jasmine aromatherapy ($p=0.52$).

Tabel 2. Results of analysis of the effect of lavender aromatherapy on dysmenorrhea

Intervention	Mean	SD	p
Pre-test	5.00	0.72	<0.001
Post-test	2.35	0.48	

Tabel 3 Results of analysis of the effect of lavender aromatherapy on dysmenorrhea

Intervention	Mean	SD	p
Pre-test	5.00	0.72	<0.001
Post-test	2.45	0.51	

Tabel 4. Results of analysis of differences in the effectiveness of lavender aromatherapy and jasmine aromatherapy for dysmenorrhea

Intervention	Mean	SD	p
Lavender Aromatherapy	19.50	0.48	0.520
Jasmine Aromatherapy	21.50	0.51	

DISCUSSION

1. Difference in pain scale before and after treatment of lavender aromatherapy and jasmine aromatherapy.

The result of the research indicated that all of the respondents before being given lavender aromatherapy and jasmine aromatherapy experienced moderate pain with mean score at 5.00. Based on the result of unstructured interview which applied during the implementation of research suggested that the occurrence of moderate pain caused by stress. The stress triggered by many assignments, facing midterm examination, and various personal problems. This is in accordance with previous research conducted in (Priyanti, 2014) which suggested that the higher the level of stress experienced by a person, the higher the dysmenorrhea experienced. The emergence of pain during menstruation is usually caused by stress that can interfere the endocrine system, which can cause irregular periods and pain during menstruation (Hawari, 2011). This is supported by research conducted in (Sari, 2015) which revealed that when a person experiences stress, the body will produce excessive estrogen and prostaglandin hormones, where the estrogen hormone can increase uterine contractions and adrenaline can cause which can cause pain during menstruation.

The result of the research indicated that all of the respondents after being given lavender aromatherapy and jasmine aromatherapy

experienced mild pain scale with the mean score at 2.35, SD=0.48 for lavender aromatherapy and the mean score at 2.45, SD=0.51 for jasmine aromatherapy. This is because respondents feel relaxed and comfortable, even some of the respondents fall asleep resulting in reducing the intensity of dysmenorrhea. When someone relaxes well and is supported by a calm environment, it will have an effect on decreasing the intensity of pain (Solehati & Kosasih, 2015). Based on the result of this research, the lavender aromatherapy can reduce the intensity of pain during menstruation. This is in accordance with the study in (Pustikawaty, 2016) who revealed that lavender aromatherapy can decrease the intensity of the pain scale, that is 75% of respondents experienced mild pain. This is also supported by research conducted in (Gunardi, 2015) that there was a decrease in pain intensity after the treatment of lavender aromatherapy, 60% of respondents experience no pain, 35% experience pain. Furthermore, another study conducted in (Maharani, 2016) who revealed that the average intensity of pain before being given lavender aromatherapy was 4.7 (moderate pain) and after being given aromatherapy lavender was 2.7 (mild pain).

Based on the results of this research jasmine aromatherapy can reduce the intensity of pain during menstruation. This is in accordance with the research conducted in (Agustina, 2016) that suggested after the

treatment of jasmine aromatherapy, there was a decrease in the intensity to mild pain scale by 65% of respondents. This is also in line with research conducted in (Sari, 2015) that after the treatment of jasmine aromatherapy there was a decrease in the intensity of the mild pain scale by 56.2%, moderate pain by 12.5%, and no pain by 31.2%. This also supported by research conducted in (Agustina, 2016) which revealed that the average intensity of dysmenorrhea before being given aromatherapy jasmine was 5.85 (moderate pain) and after being given aromatherapy jasmine was 3.25 (mild pain).

The results of this research indicated that lavender aromatherapy and jasmine aromatherapy have an effect on decreasing the intensity of dysmenorrhea. In the application of lavender aromatherapy, intensity of dysmenorrhea was decreased after lavender aromatherapy intervention (Mean= 2.35; SD= 0.48) and it was statistically significant ($p < 0.001$), meaning that there is a difference between intensity of dysmenorrhea before and after lavender aroma therapy. While in the application of jasmine aromatherapy, intensity of dysmenorrhea was decreased after jasmine aromatherapy intervention (mean=2.45 ; SD= 0.51) and it was statistically significant ($p < 0.001$), meaning that there is a significant difference between the intensity of dysmenorrhea before and after Jasmine aromatherapy.

The application of lavender aromatherapy and jasmine aromatherapy through inhalation, where the receptor cells in the nose stimulated and impulses are transmitted through the olfactory tract to center of emotional of the brain or limbic system, where it will stimulate the hypothalamus to release endorphin and serotonin hormones. The endorphin function as natural pain killer, while serotonin can improve the mood, relax and calm (Koensoemardiyah, 2009).

2. The difference in effectiveness in the lavender aromatherapy and jasmine aromatherapy groups.

The results of this study indicated that both lavender aromatherapy and jasmine aromatherapy are equally effective in decreasing the intensity of dysmenorrhea. The statistical analysis using Mann Whitney test suggested intensity of dysmenorrhea was reduced with lavender aromatherapy (Mean= 19.50; SD= 0.48) and jasmine aromatherapy (Mean= 21.50; SD= 0.51), there was no statistically significant difference in effectiveness between lavender and jasmine aromatherapy ($p = 0.524$).

This is in accordance with research conducted in (Pujiwati, 2018) research on the effect of lavender essential oil compared to rose essential oil on dysmenorrhea intensity in adolescents, which suggested that lavender aromatherapy is effective in decreasing the intensity of dysmenorrhea. The Wilcoxon test suggested that there was a difference between the intensity of dysmenorrhea before after lavender aromatherapy with p value = $0.000 < 0.05$ and Mann Whitney test suggested that there was no significant difference between lavender aromatherapy and rose essential oil with $p = 0.114$, which means Lavender and rose essential oils are equally effective in reducing the intensity of dysmenorrhea in adolescents.

This is also supported by research conducted in Sarwinanti (2016), which revealed that jasmine aromatherapy was more effective in reducing the intensity of dysmenorrhea compared to deep breathing relaxation technique. The lavender aromatherapy and jasmine aromatherapy are equally effective in reducing the intensity of dysmenorrhea. This is because both lavender and jasmine contain Linalool. Linalool is the main active chemical components which is directly affect the limbic system (Koensoemardiyah, 2009) When the essential oil is inhaled, linalool broken

down into volatile molecules that will be carried to receptor cells to the nose. Then an electrochemical message will be transmitted through the olfactory channel to the limbic system which will stimulate the hypothalamus to release endorphin and serotonin hormones. The endorphin function as natural pain killer, while serotonin can improve the mood, relax and calm which resulted in reducing the intensity of dysmenorrhea (Solehati and Kosasih,2015) (Koensoemardiyah, 2009)

This study has several limitations. First, this research is performed on university students in eastern part of Indonesia. The generalization of these results to other parts of Indonesia or other countries may be limited. Second, this study did not use a thermometer to measure the temperature of hot water, which is mixed with aromatherapy because it used aromatherapy glass furnace. Third, lack of research and reference on jasmine aromatherapy particularly inhalation technique. The lavender aromatherapy and jasmine aromatherapy are equally effective in decreasing the intensity of dysmenorrhea of female students of Faculty of Public Health, Universitas Nusa Cendana, Kupang. It is hoped that this research can contribute new knowledge related to the use of non pharmacological therapy in the management of dysmenorrhea among adolescents that are safe, inexpensive, and easy to use.

AUTHOR CONTRIBUTION

Maria Antonia Nurak, M. Dinah Charlota Lerik, Paula Tibuludji, Muntasir, and Refli examine the effectiveness of Lavender and Jasmine aromatherapy on dysmenorrhea, did data analysis, and drafted the manuscript.

CONFLICT OF INTEREST

This research has no conflict of interest "or" The author states that the research was conducted in the absence of a commercial or

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