

INFORMASI ARTIKEL

Received: January, 05, 2025

Revised: January, 15, 2025

Available online: January, 16, 2025

at: <https://e-jurnal.iphorr.com/index.php/mchc>

Effectiveness of lavender aromatherapy in reducing dysmenore

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Abstract

Background: Adolescence, which occurs between the ages of 11 and 20, is also a period of maturation of the human reproductive organs, also known as puberty. Menstruation is the most common problem experienced by teenagers today. Early menarche, lack of exercise, abnormal menstrual cycles, and alcohol consumption are some of the causes of dysmenorrhea. The World Health Organization reported in 2020 that 1,769,425 adolescent girls experienced dysmenorrhea (90%) of the total and 10%-15% of them experienced severe dysmenorrhea. In Indonesia, 64.25% of productive women experience menstrual pain.

Purpose: To identify the effectiveness of lavender aromatherapy in reducing dysmenorrhea in adolescents.

Method: This research was quantitative, with a pre-experimental design using a single-group pre-post test approach. The study was conducted MTS Mumbulsari Jember with 40 respondents. Data collection used purposive sampling and a Numeric Rating Scale (RRS) instrument to determine pain intensity and aromatherapy candles.

Results: From the T-Test calculation with a p value of $0.000 < \alpha (0.05)$, which means there is a relationship between lavender aromatherapy in reducing dysmenorrhea. Aromatherapy works by influencing the emotional center in the limbic system, providing a calming and relaxing effect on the body, which can reduce pain.

Conclusion: Relaxation therapy with aromatherapy is recommended as a self-administered technique to treat dysmenorrhea, thereby reducing the use of analgesics.

Suggestion: The results of this study are expected to be a reference for female students regarding non-pharmacological methods to reduce menstrual pain.

Keywords: Dysmenorrhea; Lavender Aromatherapy.

INTRODUCTION

Adolescence, which occurs between the ages of 11 and 20, is also a period of maturation of the human reproductive organs, also known as puberty. Menstruation is the most common problem experienced by adolescents today (Nuzula & Oktaviana, 2019). Menstruation is a natural cycle in the female reproductive system characterized by the discharge of blood from the vagina (Putri, Mediaarti, & Noprika, 2021). During menstruation, women most often experience menstrual pain or dysmenorrhea (Nurbaiti, 2021). Dysmenorrhea causes adolescent girls to experience abdominal cramps and back pain, which disrupts activities and reduces concentration for learning (Revianti & Yanto, 2021).

The World Health Organization (WHO) reported that in 2020, 1,769,425 adolescent girls experienced dysmenorrhea (90%) of the total, and 10%-15% of them experienced severe dysmenorrhea (Herniawati, Hakim, & Agustiani, 2025). In Indonesia, 64.25% of productive women experience menstrual pain (Mivanda, Follona, & Aticeh, 2023). The incidence of dysmenorrhea in East Java shows a primary dysmenorrhea incidence of 71.3% (Putri, Nugraheni, & Ningsih, 2023). According to previous findings conducted at SMPN 3 Jember, the majority of 82 respondents experienced dysmenorrhea, as many as 57 respondents (69.5%) (Huda & Ningtyias, 2020).

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Early menarche (first menstruation before 12 years old), lack of exercise, longer-than-normal menstrual cycles, alcohol consumption, and a positive family history are some of the causes of dysmenorrhea (Qomarasari, 2021). During menstruation, women will experience pain, which varies from woman to woman. Common symptoms include heartburn, stabbing abdominal pain, and leg weakness (Apriliani, Purba, Dewanti, Herawati, & Faizal, 2021). Menstrual pain is divided into two types: primary and secondary dysmenorrhea. The former occurs before or during menstruation and does not cause complications. The latter occurs due to certain medical problems (Anggraini, Lasiaprianti, & Danianto, 2022). Based on the intensity of the pain, dysmenorrhea is divided into mild, moderate, and severe. Moderate to severe dysmenorrhea requires treatment because it can interfere with activities (Ayu, Gde, Yudha, & Nyoman, 2023).

Dysmenorrhea prevention can be done through pharmacological and non-pharmacological methods. Painkillers such as ibuprofen, paracetamol, dexamethasone, aspirin, meloxicam, and ketorolac are some of the drugs that can be used to prevent dysmenorrhea. Non-pharmacological therapies include regular rest, warm compresses, and oil inhalation (Ilham et al., 2022). Other non-pharmacological therapies that can be done include aromatherapy and essential oils, which can be used as complementary therapies to relieve symptoms and improve overall quality of life (Octaviani, Sumarni, and Tamara 2019). Lavender flowers are one of the most popular aromatherapy treatments. Lavender oil can be inhaled or massaged into linoleum (Zelvia Barreto, Evy Ernawati, 2023). Lavender flowers can calm, soothe, and improve blood circulation, thereby

reducing menstrual pain (Ningrum and Hidayatunnikmah 2023).

RESEARCH METHOD

This quantitative study employed a pre-experimental design using a one-group pre-post test approach. The population was female students at Mumbulsari Islamic Junior High School (MTS) in Jember, with purposive sampling used. The sample size was selected based on inclusion and exclusion criteria, with 40 respondents. The Numeric Rating Scale (NRS) was used to measure menstrual pain intensity, and aromatherapy candles were used to reduce dysmenorrhea pain. The analysis used a correlation t-test.

The inclusion criteria for this study were female students who were willing to participate, had menstruated, were aged 13-16, and experienced dysmenorrhea on the 2nd or 3rd day. The exclusion criteria were students who were unwilling to participate, were absent from school, and had never menstruated. The independent variable was lavender aromatherapy, and the dependent variable was dysmenorrhea.

This study used two questionnaires: a Numeric Rating Scale (NRS) to assess dysmenorrhea levels and a menstrual cycle questionnaire. The NRS is a standard method for measuring pain levels, so this study did not retest its validity and reliability. This study used a reliability test using SPSS statistics. Cronbach's alpha coefficient was used to measure reliability. If the alpha coefficient is >0.60 , it is considered reliable; if the alpha coefficient is <0.60 , the question cannot be used. This study has passed the ethical review from the ethics committee No: 299/03/KEPK-STIKESBWI/VII/2024.

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DOI: 10.56922/mchc.v4i10.2299

RESEARCH RESULTS

Table 1. Frequency Distribution of Respondents (N=40)

Variable	Results
Age (Mean±SD) (Range) (Year)	(15.23±6.367) (13-16)
<14	10/25.0
14-15	24/60.0
>16	6/15.0
Class (n/%)	
7	12/30.0
8	12/30.0
9	16/40.0
Dysmenorrhea Day (n/%)	
Day 2	24/65.0
Day 3	14/35.0
Pain Scale (n/%)	
0 (No Pain)	0/0
1-3 (Mild Pain)	15/37.5
4-6 (Moderate Pain)	22/55.0
7-10 (Severe Pain)	3/7.5

Table 1 shows that the mean age and standard deviation of respondents are (15.23±6.367) with an age range of (13-16). The majority of respondents are in grade 9, namely 16 (40.0%), with the majority of dysmenorrhea on the 2nd day as many as 24 respondents (65.0%) and pain levels of 4-6 (moderate pain) amounting to 22 respondents (55.0%).

	Mean	Std. Deviasi	T	Sig. (2-tailed)
Pre-Post test	2.85	0.864	20.867	0.000

The results of the T-Test calculation with a p value of $0.000 < \alpha (0.05)$ table 2 show that giving lavender aromatherapy is effective in reducing dysmenorrhea in adolescent girls, which means H_a is accepted and H_o is rejected.

DISCUSSION

The results of the study showed that the intensity of dysmenorrhea in female students at MTs. Mumbulsari Jember before aromatherapy was administered was measured using the NRS (Numeric Rating Scale) as shown in Table 4.5. Most students experienced moderate pain, as many as 22 (55%).

Dysmenorrhea occurs during menstruation, when the uterine wall increases prostaglandin production, which causes stronger and excessive uterine contractions (Sanday, Kusumasari, & Sari, 2019). According to previous research, dysmenorrhea negatively impacts daily life, where the pain can affect students' function and well-being, including impaired concentration and school attendance (Purwaningtias, Puspitasari, & Ernawati, 2021). Pain during menarche is influenced by physiological and psychological factors (Sulastris & Virna, 2023). The age of menarche can vary from person to person, but it is considered normal if it occurs between the ages of 12-14. Menarche that occurs too early (<12 years) can

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indicate that the reproductive organs are not yet developed and functioning (Putri et al., 2023).

Based on the description above, the majority of female students experience dysmenorrhea. This condition is likely caused by physiological factors such as hormonal changes or psychological factors including mental unpreparedness in facing menarche. In fact, the majority of female students experience moderate pain at the age of 14, which is a process of adaptation to facing menarche.

Based on the results of a study on dysmenorrhea intensity after 15 minutes of aromatherapy using the NRS (Numeric Rating Scale), 10 people experienced no dysmenorrhea pain, 29 experienced mild pain, and 2 experienced moderate pain.

Aromatherapy is a natural, non-invasive therapy designed to affect individuals holistically, not only addressing symptoms or illnesses but also reducing nausea, vomiting, and pain (Sulastri & Virna, 2023). Previous research has shown that aromatherapy can improve various physical complications, including pain (Langingi, Saluy, & Kaparang, 2022). Therefore, aromatherapy is recommended as a treatment method because it has relaxing and analgesic effects that can influence the brain's systems that regulate emotions and mood, thereby helping to reduce tension, stress, and anxiety (Nasution & Manullang, 2023).

Based on the above description, aromatherapy has relaxing and analgesic properties that can help reduce the intensity of menstrual pain. Furthermore, aromatherapy also provides psychological relaxation. Reducing stress and anxiety levels can contribute to a reduced perception of pain, making adolescent girls feel more comfortable during menstruation.

After analyzing the data using a t-test with an error rate of $\alpha = 0.05$, the p-value was obtained = 0.000. Since $p = 0.000 < \alpha = 0.05$, H_0 is rejected and H_a is accepted. This indicates that lavender aromatherapy affects the intensity of dysmenorrhea in female students at MTs Mumbulsari Jember.

Essential oils used in aromatherapy can relax the body and reduce pain (Barreto, Ernawati, & Prabandari, 2023; Rayatin et al. 2023). When inhaled, lavender oil enters the nose, sends messages to the emotional center in the limbic system, and then sends messages back throughout the body via the circulatory system (Hidayati, 2019). Other studies

have found that the relaxation effect appears on average 15 minutes after use, and the effects of essential oils for aromatherapy are short-term and do not accumulate in body tissues (Saputri, & Sari, 2024).

It was concluded that relaxation through lavender aromatherapy affected pain intensity in female students at MTs Salafiyah Syafiiyah Jember. Aromatherapy works by influencing the emotional center in the limbic system, providing a calming and relaxing effect on the body, which can reduce pain. This aligns with the experiences of respondents who reported feeling calmer, more relaxed, and experiencing reduced pain after undergoing therapy.

CONCLUSION

The results of the analysis using the t-test showed a sig value of $p = 0.000 < \alpha = 0.05$. This causes H_0 to be rejected and H_a to be accepted, which means there is an effect of lavender aromatherapy on changes in the intensity of dysmenorrhea in female students. Limited space with ventilation can reduce the effectiveness of aromatherapy and a small sample size can affect the validity and reliability of the research results. The larger the sample, the more representative the research results.

SUGGESTION

It is hoped that further research can be conducted by other researchers with a focus on different factors and variables to deepen understanding of dysmenorrhea in the future.

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