

**THE EFFECT OF WARM COMPRESSES ON REDUCING DYSMENORRHEA
PAIN INTENSITY AMONG ADOLESCENT GIRLS AT SMP NEGERI 10
BATAM**

¹Salsabila, ²Mariyana

¹Salsabilarzn06@gmail.com ²Mariyana@univbatam.ac.id

^{1,2}Midwifery Study Program, Universitas Batam

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ABSTRACT

Dysmenorrhea is a common menstrual disorder characterized by abdominal cramping and pain that may interfere with daily activities, particularly among adolescent girls. This study aimed to determine changes in dysmenorrhea pain intensity before and after warm compress therapy among adolescent girls at SMP Negeri 10 Batam. A quantitative analytical study using a pre-experimental one-group pretest-posttest design was conducted in 2024. Thirty adolescent girls who were menstruating, experienced primary dysmenorrhea, met the eligibility criteria, and were willing to participate were recruited using purposive sampling. Pain intensity was measured using the Visual Analog Scale (VAS) with a score range of 0–10 before and after the intervention. Warm compresses were applied to the lower abdominal area using a hot-water bottle wrapped in cloth, with water maintained at 37–40°C. The intervention was administered twice, and pain intensity was reassessed after the second application. Data were analyzed using univariate and bivariate analyses. The Shapiro–Wilk test showed that the data were not normally distributed; therefore, the Wilcoxon signed-rank test was used. The mean pain intensity decreased from 3.17 before the intervention to 1.47 after the intervention, with a statistically significant difference ($p < 0.001$). These findings suggest that warm compress therapy may help reduce dysmenorrhea pain intensity among adolescent girls.

Keywords : *Dysmenorrhea, Menstrual Pain, Warm Compress, Adolescent Girls, Pain Intensity.*

INTRODUCTION

Adolescence is a transitional stage between childhood and adulthood characterized by substantial physical, physiological, psychological, and hormonal changes. The World Health Organization (WHO) defines adolescents as individuals aged 10–19 years. During this period, hormonal maturation contributes to puberty and reproductive development, including the onset of menstruation among adolescent girls (Maidartati, 2018).

Menstruation is a normal physiological process involving periodic shedding of the endometrial lining. However,

menstrual-related problems may occur, with dysmenorrhea being one of the most common. Dysmenorrhea refers to menstrual pain, particularly cramping in the lower abdomen, which may vary in intensity and, in some cases, interfere with daily activities and quality of life (Handayani, 2022).

Dysmenorrhea is a common health problem among women of reproductive age. In Indonesia, its reported prevalence is approximately 64.25%, consisting of 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea (Hannan, 2022). Primary dysmenorrhea is particularly common among adolescents and is generally associated with increased

prostaglandin activity, which stimulates uterine contractions and contributes to menstrual pain. Symptoms may include lower abdominal cramps accompanied by back pain, nausea, vomiting, headache, or dizziness (Mutiah, 2023).

The prevalence of dysmenorrhea among Indonesian adolescents remains substantial. Previous research reported a prevalence of 95.7% among adolescent girls aged 15–16 years in Bangko District, Rokan Hilir Regency, Riau (Putri, 2019; Frida Utari, 2022). Local data also demonstrate the importance of adolescent reproductive health services in Batam City. According to the Batam City Health Office, the number of adolescent girls served through adolescent-friendly reproductive health services (Pelayanan Kesehatan Peduli Remaja/PKPR) was relatively high in several health center areas, including Puskesmas Batu Aji (13,853), Puskesmas Sei Langkai (11,211), and Puskesmas Sei Pancur (10,153) (Batam City Health Office, 2018).

Dysmenorrhea may present as intermittent or continuous lower abdominal cramps and may radiate to the lower back, groin, or legs. It may also occur with other menstrual-related symptoms, including fatigue, headache, nausea, breast tenderness, abdominal bloating, irritability, mood changes, and sleep disturbances (Arlym, 2023). When pain is sufficiently severe, dysmenorrhea may interfere with daily activities and school participation. Among adolescent girls, menstrual problems have been associated with school absenteeism and reduced academic participation (Amalya Riska, 2022).

Dysmenorrhea is commonly classified as primary or secondary. Primary dysmenorrhea occurs without an underlying pelvic pathology and is generally associated with excessive

uterine contractions during menstruation. Secondary dysmenorrhea, in contrast, is related to an underlying condition such as endometriosis, pelvic infection, or ovarian disorders. The present study focuses on primary dysmenorrhea among adolescent girls.

Management of dysmenorrhea includes pharmacological and non-pharmacological approaches. Pharmacological treatment commonly involves analgesics, hormonal therapy, and non-steroidal anti-inflammatory drugs (NSAIDs). Although these treatments can relieve pain, non-pharmacological approaches may provide accessible alternatives, particularly in school-based adolescent health settings.

Several non-pharmacological interventions have been used to manage menstrual pain, including acupuncture, massage, relaxation techniques, music therapy, and warm compresses. Warm compress therapy is a simple intervention that can be applied directly to the painful area using a warm-water bottle or cloth. Heat transfer through conduction may promote vasodilation, improve local circulation, and reduce muscle tension, potentially contributing to decreased pain intensity (Martaulina Sinaga, 2022; Aminah et al., 2022). Its relatively simple application also makes it feasible for adolescent health education and self-care. Although previous studies have reported the potential benefits of warm compresses for dysmenorrhea, evidence regarding their application among adolescent girls in specific school settings remains limited. Previous research in Riau has primarily demonstrated the high prevalence of dysmenorrhea among adolescents, while local evidence concerning changes in pain intensity following a warm compress intervention among students in Batam remains limited. This indicates a need for context-specific research evaluating changes in dysmenorrhea pain intensity

following the application of warm compresses.

SMP Negeri 10 Batam was selected as the study setting to provide evidence from a school-based adolescent population in Batam City. Evaluating a simple non-pharmacological intervention in this setting may provide practical evidence for adolescent reproductive health promotion and pain management within the school environment.

Therefore, this study aimed to determine the change in dysmenorrhea pain intensity before and after the administration of warm compresses among adolescent girls at SMP Negeri 10 Batam in 2024.

RESEARCH OBJECTIVES

This study aimed to:

1. Determine the intensity of dysmenorrhea pain among adolescent girls before the administration of warm compresses.
2. Determine the intensity of dysmenorrhea pain among adolescent girls after the administration of warm compresses.
3. Analyze the effect of warm compresses on dysmenorrhea pain intensity among adolescent girls.

RESEARCH METHODS

This study employed a quantitative analytical approach using a pre-experimental one-group pretest-posttest design. The study was conducted at SMP Negeri 10 Batam in 2024 to assess changes in dysmenorrhea pain intensity before and after warm compress therapy.

Population consisted of approximately female students at SMP Negeri 10 Batam during July–August

2024. With sample 30 students were menstruating, experiencing primary dysmenorrhea, meeting the eligibility criteria, and willing to participate, selected using purposive sampling. The inclusion criteria were:

- (1) willingness to participate and provide informed consent;
 - (2) experiencing primary dysmenorrhea on the day of data collection;
 - (3) having no other health conditions; and
 - (4) not receiving pharmacological treatment during menstruation.
- Participants who did not meet these criteria were excluded.

Pain intensity was assessed using the Visual Analog Scale (VAS) with a score range of 0–10, where 0 indicated no pain and 10 indicated the most severe pain. The pain categories used in the study were no pain (0), mild pain (1–3), moderate pain (4–6), and severe pain (7–10). The VAS was administered before the intervention as the pretest and after the intervention as the posttest.

The intervention was warm compress therapy using a hot-water bottle (*buli-buli panas*) wrapped in a cloth. The water temperature was maintained at 37–40°C. The compress was administered to the area affected by dysmenorrhea, particularly the lower abdominal area, and was given twice according to the study procedure. The equipment included a hot-water bottle, cloth or cover, and warm water. The procedure included explaining the intervention, hand hygiene, maintaining privacy, checking the water temperature, filling the bottle, checking for leakage, wrapping the bottle with a cloth, and applying the warm compress. Pain intensity was reassessed after the second warm-compress application.

Data were analyzed using univariate and bivariate analyses. The Shapiro–Wilk test was used to assess normality. The results showed that both pretest and posttest pain scores were not normally distributed ($p < 0.05$); therefore, the Wilcoxon signed-rank test was used to compare pain intensity

before and after the intervention. Statistical significance was set at $\alpha = 0.05$.

RESULTS

Characteristics of Respondents

Table 1. Distribution of Respondent Characteristics

No	Variable	N	%
1.	Age		
	12-14 years	26	86,7
	15-17 years	4	13,3
	Total	30	100
2.	Education		
	Junior High School	30	100
	Total	30	100

Based on Table 1, it can be seen that among the 30 respondents, the majority were aged 12–14 years, accounting for 26 respondents (86.7%). In terms of educational level, the majority of respondents were junior high school students, accounting for 30 respondents (100%). Were 12–14 years old, comprising 26 participants (86.7%), while 4 respondents (13.3%) were aged 15–17 years. All respondents were junior high school students, representing 100% of the sample.

Table 2. Mean Dysmenorrhea Pain Intensity Before and After Warm Compress Therapy

Variable	Mean	N	SD
Pretest	3,17	30	0.592
Posttest	1,47	30	0.507

Table 2 demonstrates a reduction in the mean dysmenorrhea pain intensity following the warm compress intervention. The mean pain score decreased from 3.17 before the intervention to 1.47 after the intervention.

Table 3. Normality Test of Dysmenorrhea Pain Intensity

Variable	Mean	N	SD	<i>p</i> value
Pretest	3,17	30	0.592	0,000
Posttest	1,47	30	0.507	

Table 3 indicates that the data did not meet the normality assumption. Therefore, a non-parametric statistical test, namely the Wilcoxon signed-rank test, was subsequently applied to assess the difference between pre-intervention and post-intervention pain intensity.

Table 4. Difference in Dysmenorrhea Pain Intensity Before and After Warm Compress Therapy

Variable	Mean	N	SD	<i>P</i> Value
Pretest	3,17	30	0.592	0,001
Posttest	1,47	30	0.507	

Based on the analysis results, the mean pretest score was 3.17 with a standard deviation of 0.592 among 30 respondents. Following the intervention, the mean posttest score decreased to 1.47 with a standard deviation of 0.507 among the same 30 respondents. The statistical test showed a p-value of 0.001 ($p < 0.05$), indicating a statistically significant difference between the pretest and posttest scores. Therefore, there was a significant change in the scores following the intervention.

DISCUSSION

This study was conducted from July to August 2024 and involved 30 adolescent girl experiencing dysmenorrhea. Participants were selected using purposive sampling based on the predetermined inclusion criteria. Because the study employed a one-group pretest-posttest design, no control group was included and all respondents received warm compress therapy. Data were collected using

questionnaires and pain-intensity measurements.

The collected data were analyzed using univariate and bivariate analyses. The Wilcoxon signed-rank test was used for the bivariate analysis because the data were not normally distributed. The statistical significance level was set at $\alpha = 0.05$. The findings are discussed below.

A. Dysmenorrhea Pain Intensity Before Warm Compress Therapy

Dysmenorrhea refers to menstrual pain, most commonly experienced as cramping in the lower abdomen. The intensity of menstrual pain varies considerably among individuals, ranging from mild discomfort to severe pain that interferes with daily activities. The underlying mechanism of primary dysmenorrhea is primarily associated with excessive uterine contractions stimulated by prostaglandins. Increased prostaglandin activity may contribute to uterine ischemia and the development of pain, particularly when progesterone levels decrease during menstruation (Lestari, 2020).

Among adolescent girls, dysmenorrhea may present as intermittent or sharp lower abdominal pain accompanied by cramping. The discomfort may radiate toward the lower back, thighs, groin, or vulvar area. Menstrual pain may also occur together with premenstrual symptoms, including emotional instability, irritability, anxiety, fatigue, sleep disturbances, headaches, nausea, breast tenderness, and abdominal bloating.

Research by Anjani et al. (2022) found that, during the pretest assessment, most adolescent respondents experienced moderate dysmenorrhea, accounting for 85.0%, while 15.0% experienced severe pain. These findings

support the understanding that dysmenorrhea is a subjective experience, and pain perception may differ between individuals. Factors such as psychological stress may also influence menstrual symptoms through their effects on the endocrine system and menstrual cycle.

Similarly, Haris et al. (2022) reported that prior to warm compress therapy, 22 of 23 respondents (95.7%) experienced moderate menstrual pain, whereas one respondent (4.3%) experienced severe pain. Menstruation itself is a normal physiological process involving the periodic shedding of the uterine endometrium. However, the physiological changes associated with menstruation can produce discomfort and pain in some adolescent girls.

Based on the present findings, relevant theories, and previous studies, dysmenorrhea remains a common problem among adolescent girls. Menstrual pain may become more noticeable during the early days of menstruation and may be aggravated by psychological stress, academic demands, inadequate rest, or other lifestyle factors. Before receiving information and intervention regarding dysmenorrhea management, some adolescent girls may simply wait for the pain to resolve without using an appropriate pain-management strategy. In some cases, menstrual pain may persist for two to three days during the menstrual period.

B. Dysmenorrhea Pain Intensity After Warm Compress Therapy

Following the administration of warm compresses, the mean dysmenorrhea pain intensity decreased to 1.47, with a standard deviation of 0.507. Dysmenorrhea is generally associated with uterine contractions stimulated by prostaglandins. The resulting cramping sensation is most commonly experienced in the lower

abdomen and may vary in intensity. The severity of pain differs among individuals and may be influenced by physiological, psychological, and lifestyle-related factors (Lestari, 2020).

Pain associated with dysmenorrhea may be managed pharmacologically using non-opioid analgesics such as aspirin, mefenamic acid, and paracetamol. However, pharmacological treatment may be associated with adverse effects, particularly when medications are taken at inappropriate doses or without adequate professional guidance. Therefore, non-pharmacological interventions may provide a useful complementary approach to pain management.

One such intervention is warm compress therapy. The application of heat to the lower abdomen may produce vasodilation, improve local blood circulation, and promote muscle relaxation. Improved circulation may enhance the delivery of oxygen and nutrients to tissues while facilitating the removal of metabolic waste. These physiological effects may contribute to the reduction of dysmenorrhea pain.

Warm compress therapy generally involves applying a warm-water-filled bottle or other heat source to the lower abdominal area. Previous research has described the application of warm water at approximately 37–40°C for around 15 minutes as a non-pharmacological intervention for primary dysmenorrhea. The heat generated by the compress may reduce uterine and smooth-muscle tension, thereby decreasing the intensity of pain (Nisa & Kamidah, 2023).

Mutia, Novhriyanthi, and Alamsyah (2024) reported that the application of warm compresses resulted in a reduction in dysmenorrhea severity among adolescent respondents. Of the

31 respondents included in their study, 13 participants (41.93%) experienced a reduction in pain to a mild level. The findings demonstrated a meaningful change in pain intensity following the intervention.

The findings of the present study are consistent with previous evidence indicating that warm compresses can help alleviate menstrual pain. The reduction in pain may not only improve physical comfort but may also help adolescent girls participate more comfortably in learning activities and reduce the psychological distress associated with persistent menstrual pain. In addition, warm compress therapy is relatively simple, portable, inexpensive, and easy to implement, making it a practical option for adolescent girls who experience dysmenorrhea.

C. Effect of Warm Compress Therapy on Dysmenorrhea Pain Intensity

The bivariate analysis using the Wilcoxon signed-rank test and SPSS version 26 yielded a p-value of 0.000, which was below the predetermined significance level of 0.05. Therefore, the null hypothesis was rejected, indicating a statistically significant difference in dysmenorrhea pain intensity before and after warm compress therapy among adolescent girls at SMP Negeri 10 Batam in 2024.

Dysmenorrhea is characterized by menstrual pain, commonly in the form of lower abdominal cramping. The pain is primarily associated with increased prostaglandin activity, which stimulates uterine contractions and contributes to reduced uterine blood flow. Consequently, interventions capable of promoting muscle relaxation and improving local circulation may contribute to pain reduction (Lestari, 2020).

Warm compress therapy represents a non-pharmacological intervention that may address these physiological mechanisms.

Heat applied to the lower abdominal region promotes vasodilation and increases local circulation. It may also reduce muscle tension and promote relaxation of the uterine smooth muscle. These effects may explain the reduction in pain intensity observed after the intervention.

Previous research by Anjani et al. (2022) reported reductions in dysmenorrhea pain among adolescent girls receiving warm compress therapy. The researchers also noted that other factors, including physical activity, sleep quality, and dietary patterns, could influence menstrual pain. Physical activity, for example, may improve circulation and oxygen delivery to tissues and therefore contribute to a reduction in pain perception.

The present findings suggest that warm compress therapy can be used as a simple non-pharmacological approach to manage dysmenorrhea among adolescent girls. The intervention may be particularly useful during the first several days of menstruation, when menstrual pain is commonly most pronounced. In addition to reducing pain, the use of warm compresses may improve comfort and facilitate participation in school and other daily activities.

Based on the findings of the study, relevant theoretical concepts, and previous research, warm compress therapy appears to have a significant effect on reducing dysmenorrhea pain intensity among adolescent girls at SMP Negeri 10 Batam. The Wilcoxon signed-rank analysis demonstrated an Asymp. Sig. (2-tailed) value of 0.000 ($p \leq 0.05$), indicating a statistically significant difference between pain intensity before and after the intervention.

CONCLUSION

Based on the findings of this study conducted among adolescent girls at SMP Negeri 10 Batam, the following conclusions can be drawn:

1. Before the administration of warm compress therapy, the mean dysmenorrhea pain intensity score was 3.17 (SD = 0.592). Among the 30 respondents assessed before the intervention, 19 participants (63.3%) experienced moderate pain based on the reported pain classification.
2. Following the administration of warm compress therapy, the mean dysmenorrhea pain intensity decreased to 1.47 with a standard deviation of 0.507. Among the 30 respondents assessed after the intervention, 16 participants (53.3%) reported no pain.
3. The Wilcoxon signed-rank test demonstrated a statistically significant difference in dysmenorrhea pain intensity before and after the intervention, with an Asymp. Sig. (2-tailed) value of 0.000 ($p \leq 0.05$). Therefore, warm compress therapy had a significant effect on reducing dysmenorrhea pain intensity among adolescent girls at SMP Negeri 10 Batam in 2024.

RECOMMENDATIONS

1. For Respondents

The findings of this study are expected to increase adolescent girls' knowledge regarding dysmenorrhea and encourage them to consider warm compress therapy as a simple non-pharmacological method for managing menstrual pain.

2. For Midwifery Students and Practicing Midwives

The findings may serve as additional information for midwifery students and practicing midwives in providing

promotive and preventive reproductive health services, particularly education regarding non-pharmacological approaches to dysmenorrhea management.

3. For Future Researchers

Future researchers are encouraged to use these findings as a reference for conducting further studies concerning warm compress therapy and dysmenorrhea. Subsequent research may employ larger samples, control groups, randomized designs, or comparisons with other non-pharmacological interventions to provide stronger evidence regarding treatment effectiveness.

4. For the Community

The findings are expected to increase community awareness regarding dysmenorrhea among adolescent girls. Parents, teachers, and community health workers can provide appropriate education and support so that adolescent girls understand the causes, symptoms, and available strategies for managing menstrual pain.

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