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WARM WATER COMPRESS CAN REDUCE PRIMARY DYSMENOREAL PAIN IN MIDWIFERY STUDENTS

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ABSTRAK : KOMPRES AIR HANGAT DAPAT MENURUNKAN NYERI DISMENORE PRIMER PADA MAHASISWA KEBIDANAN

Latar Belakang: Dismenore primer merupakan keluhan menstruasi yang paling umum dialami perempuan usia reproduksi dan sering berdampak pada aktivitas fisik maupun konsentrasi belajar. Kondisi ini muncul akibat peningkatan produksi prostaglandin yang memicu kontraksi uterus berlebihan sehingga menimbulkan nyeri. Penanganan non-farmakologis seperti kompres air hangat diyakini mampu meningkatkan vasodilatasi dan relaksasi otot, sehingga berpotensi menurunkan intensitas nyeri.

Tujuan: Mengetahui pengaruh pemberian kompres air hangat terhadap penurunan nyeri dismenore primer pada mahasiswa kebidanan.

Metode: Penelitian ini menggunakan desain *Pre Experimental a one-group pre-test post-test design*, dengan jumlah sampel 22 responden yang dipilih menggunakan teknik *purposive sampling*. Analisis data dilakukan menggunakan uji *Wilcoxon Signed Ranks.*

Hasil: Sebelum intervensi, sebagian besar responden mengalami dismenore kategori sedang (54%). Setelah pemberian kompres air hangat, mayoritas responden menunjukkan penurunan nyeri menjadi kategori ringan (72%). Uji *Wilcoxon Signed Ranks* memperoleh nilai P = 0,001 yang menunjukkan bahwa kompres air hangat memberikan pengaruh signifikan terhadap penurunan nyeri dismenore primer.

Kesimpulan: T Kompres air hangat efektif menurunkan intensitas nyeri dismenore primer pada mahasiswa kebidanan dan dapat direkomendasikan sebagai pilihan terapi nonfarmakologis yang sederhana, aman, dan mudah diterapkan untuk manajemen nyeri menstruasi.

Saran: Mahasiswa disarankan menerapkan kompres air hangat sebagai upaya mandiri dalam mengelola nyeri menstruasi, dan institusi pendidikan dapat mengintegrasikan edukasi manajemen nyeri nonfarmakologis dalam kegiatan promosi kesehatan reproduksi

Kata Kunci : dismenore primer, nyeri menstruasi, kompres air hangat, terapi nonfarmakologis

ABSTRACT

Background: Primary dysmenorrhea is one of the most common menstrual complaints among women of reproductive age and often affects physical activity and learning concentration. This condition arises from increased prostaglandin production, which stimulates excessive uterine contractions and results in pain. Non-pharmacological management, such as warm compress therapy, is believed to promote vasodilation and muscle relaxation, thereby potentially reducing pain intensity

Purpose: To determine the effect of warm compress therapy on reducing primary dysmenorrhea pain among midwifery students.

Methods: This study employed a pre-experimental one-group pre-test post-test design with 22 respondents selected using a purposive sampling technique. Data were analyzed using the Wilcoxon Signed Ranks test.

Results: Before the intervention, most respondents experienced moderate dysmenorrhea (54%). After receiving warm compress therapy, the majority reported a decrease in pain intensity to the mild category (72%). The Wilcoxon Signed Ranks test showed a p-value of 0.001, indicating that warm compress therapy had a significant effect on reducing primary dysmenorrhea pain.

Conclusion: Warm compress therapy is effective in reducing the intensity of primary dysmenorrhea among midwifery students and can be recommended as a simple, safe, and easily applied non-pharmacological option for menstrual pain management.

Suggestions; Students are encouraged to use warm compresses as an independent strategy to manage menstrual pain, and educational institutions are advised to integrate non-pharmacological pain management education into reproductive health promotion activities.

Keywords: primary dysmenorrhea, menstrual pain, warm compress, non-pharmacological therapy

INTRODUCTION

Primary dysmenorrhea is a common menstrual complaint among women of reproductive age and often occurs without any structural abnormalities in the reproductive organs. This condition is characterized by cramping or lower abdominal pain before or during menstruation and frequently disrupts daily activities (Aziza et al. 2024).

The global prevalence of dysmenorrhea remains high. Systematic reviews and meta-analyses across multiple countries indicate that the pooled prevalence of dysmenorrhea is substantial, highlighting that the majority of women of reproductive age experience menstrual pain in recent studies. These findings underscore that dysmenorrhea continues to be a significant reproductive health issue on an international scale.

According to the World Health Organization (WHO) in Silviani's research (2019) the incidence of dysmenorrhea is quite high throughout the world. The average incidence of dysmenorrhea inyoung women is between 16.8 -81%. On average in European countries dysmenorrhea occurs in 45-97% of women. With the lowest prevalence in Bulgaria (8.8%) and the highest reaching 94% in Finland. The highest prevalence of dysmenorrhea is often found in adolescent women, which is estimated to be between 20-90%. About 15% of adolescents reported severe dysmenorrhea. In the United States, dysmenorrhea is recognized as the most frequent cause of school absence amongadolescent girls. In addition, a survey was also conducted in 113 US women and stated that the prevalence was 29-44%, mostly at the age of 18- 45 years (Teknik, Nafas, and Dismenorea 2019)

Among university students and adolescents, the prevalence of dysmenorrhea tends to be higher and can be more disruptive due to academic demands and social activities. Population studies among students have reported significant prevalence rates and an association between dysmenorrhea and decreased academic performance, as well as class absenteeism. Therefore, research focusing on student populations, including midwifery students, is crucial for intervention and health promotion contexts (Tolulope et al. 2024).

In Indonesia, several studies and health surveys show a high prevalence of dysmenorrhea. The 2023 Indonesian Health Survey (SKI) and subsequent local studies indicate a substantial proportion of primary dysmenorrhea among women of reproductive age, emphasizing the need for accessible and affordable interventions in higher education settings (Indonesia 2023).

Physiologically, primary dysmenorrhea is generally associated with increased uterine prostaglandin production, which triggers excessive contractions, local ischemia, and cramping, resulting in pain. This mechanism explains why interventions targeting muscle relaxation and local blood flow enhancement can effectively reduce pain (Aziza et al. 2024)

Pharmacological treatments, such as non-steroidal anti-inflammatory drugs (NSAIDs), are effective but may not be preferred by all individuals due to side effects or personal preference. Consequently, many women opt for safe, self-administered non-pharmacological methods to relieve menstrual pain. Studies frequently report widespread self-management practices, including the use of local heat, massage, or herbal remedies (Cor et al. 2024)

Heat therapy, including warm compresses or heating pads, is one of the most commonly used non-pharmacological interventions for alleviating dysmenorrhea. Evidence from several controlled trials and systematic reviews demonstrates that local heat application significantly reduces menstrual pain intensity compared to controls or medication alone (Jo and Lee 2018).

Beyond individual studies, recent comparative analyses and meta-analyses indicate that non-pharmacological interventions — including heat therapy, exercise, acupressure, and others — have positive effects on dysmenorrhea pain reduction, although the relative effectiveness varies depending on intervention protocols. This supports the need for contextual studies testing practical protocols, such as warm compresses, among specific populations (Li and Hao 2024).

In Indonesia, several nursing and midwifery studies have reported the successful use of warm compress interventions in reducing menstrual pain among adolescents and university students.

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Therefore, this intervention is considered effective, inexpensive, and easy to implement on campuses as part of reproductive health promotion programs. However, variations in study design and sample sizes require additional confirmation in local contexts, such as midwifery students (Mukhoirotin 2022)

Given the high prevalence, the pathophysiological rationale supporting local heat application, and preliminary evidence of warm compress effectiveness, this study aims to evaluate the effect of warm compress therapy on the reduction of primary dysmenorrhea intensity among midwifery students. The findings are expected to provide evidence-based recommendations for non-pharmacological interventions in educational settings (Ade and Novyani 2017).

RESEARCH METHODS

This study employed a quantitative method with a quasi-experimental design, using a pretest-posttest to compare pain before and after applying warm compresses for 15 and 20 minutes. Pain intensity was measured using a Numeric Rating Scale (NRS) prior to the warm compress intervention (pretest) to obtain baseline pain levels and was remeasured after the application of the warm compress for 15 and 20 minutes (posttest).

The population in this study was all female students in the Midwifery Study Program at the Batari Toja Bone Institute. The sample was selected from a population that met the inclusion and exclusion criteria using a purposive sampling technique. The inclusion criteria were: female respondents who were willing to participate, menstruating, suffering from primary dysmenorrhea (without other health problems), and not using pain relievers during dysmenorrhea. The study was conducted at the Batari Toja Bone Institute.

The instruments used in this study were questionnaires (pre- and post-test), measurement guidelines, warm compress equipment, and the warm compress procedure. Data were analyzed using univariate and bivariate analyses. Univariate analysis in the study included characteristics such as age, class, pain duration, day of onset, menstrual cycle, pain intensity, and average pain level. Bivariate analysis used a non-parametric test, the Wilcoxon test

RESEARCH RESULT

Univariate analysis

Table 1
Respondent Characteristic

Characteristic	N	%
Age of First Menstruation		
≤14	14	64
>14	8	36
Menstrual interval (days)		
< 21	6	27
21 – 35	10	46
> 35	6	27
Menstrual (days)		
< 3	3	13
3-7	15	68
> 7	4	19
family history of dysmenorrhea		
Yes	4	19
No	18	81

Based on Table 1, the majority of respondents were aged ≤14 years, totaling 8 individuals (64%), while those aged >14 years accounted for 14 individuals (36%). The menstrual cycle length of the respondents varied, with 6 respondents (27%) experiencing cycles of <21 days, 10 respondents (46%) having cycles between 21–35 days, and 6 respondents (27%) experiencing cycles of >35 days. The duration of menstruation was <3 days in 3 respondents (13%), 3–7 days in 15 respondents (68%), and >7 days in 4 respondents (19%). In terms of family history, 4 respondents (19%) reported having a family history of dysmenorrhea, while the remaining 18 respondents (81%) reported no such history.

Bivariate analysis

Table 2
Frequency Distribution of Dysmenorrhea Intensity Before and After Warm Compress Application

Pain Scale	Effects of Warm Compress on Dysmenorrhea				*P*
	Pre	%	Post	%	
Light	5	23	16	72	
Medium	12	54	4	19	0,001
Heavy	5	23	2	9	

Based on Table 2, there was a noticeable difference between the pain levels before and after the application of warm compress therapy. Prior to the intervention, the majority of respondents experienced moderate dysmenorrhea, totaling 12 individuals (54%). After receiving the warm compress, most respondents reported mild menstrual pain, totaling 16 individuals (72%). The Wilcoxon statistical test showed a significance value of p = 0.001, indicating that H_0 was rejected and H_1 was accepted. This result demonstrates that the application of warm compress therapy has a significant effect on reducing dysmenorrhea pain levels.

DISCUSSION

The findings of this study indicate that most respondents were in the age group ≤14 years. Early adolescence is a developmental phase marked by the maturation of the reproductive system, during which fluctuations in ovarian hormones occur more dynamically. These hormonal instabilities contribute to increased prostaglandin production, which triggers excessive uterine contractions and consequently heightens the likelihood of dysmenorrhea. Previous studies have similarly reported that early adolescents tend to experience a higher prevalence of primary dysmenorrhea due to rapid physiological changes in the reproductive system (Fitri et al. 2020)

The variation in respondents' menstrual cycles showed that most were within the normal range of 21–35 days. Nevertheless, respondents with shorter or longer cycles still reported menstrual pain. Irregular menstrual cycles often reflect an imbalance between estrogen and progesterone levels, which influences uterine contractility. This aligns with findings showing that adolescents with irregular cycles have a higher risk of dysmenorrhea due to elevated prostaglandin production (Kural et al. 2015)

Most respondents had a menstrual duration within the physiological range of 3–7 days. However, respondents experiencing menstruation lasting more than seven days tended to report more severe pain. Prolonged menstruation is often associated with heightened inflammatory responses and extended exposure to uterine contractions. These findings are consistent with (Alim, Jimmy, and Annas 2023), who observed a positive correlation between menstrual duration and dysmenorrhea severity, corresponding with increased prostaglandin release during endometrial shedding.

The majority of respondents did not have a family history of dysmenorrhea, suggesting that genetic factors are not the sole determinants of menstrual pain. Lifestyle-related factors—such as academic stress, physical inactivity, poor sleep patterns, and unhealthy dietary habits—may aggravate dysmenorrhea symptoms. (Putri and Depok 2024). emphasized that modern lifestyle patterns significantly contribute to menstrual disorders, including primary dysmenorrhea, particularly among adolescents and university students.

Before the intervention, most respondents experienced moderate pain, indicating that primary dysmenorrhea remains a substantial health concern affecting both academic performance and daily activities. This is consistent with findings reported by (Al-zahrani, Alabdulaziz, and Alghamdi 2018), who noted that female students frequently experience impaired concentration, .reduced academic productivity, and limited physical activity due to moderate menstrual pain.

The notable reduction in pain intensity after warm compress application highlights the effectiveness of this simple, accessible intervention. Physiologically, the analgesic effect of heat therapy is mediated through vasodilation, which enhances local blood flow, reduces smooth muscle spasms, and decreases nociceptive transmission. The findings are supported by (Herdiansyah et al. 2021),who demonstrated that heat therapy decreases nociceptor activity and promotes muscle relaxation in individuals experiencing dysmenorrhea

The Wilcoxon test result of p = 0,001 confirms a statistically significant effect of warm compresses on reducing dysmenorrhea pain scores. This reinforces the position of heat therapy as a safe, non-pharmacological alternative, particularly for individuals seeking to avoid analgesic medications. Comparable outcomes were reported by (Umami 2022), who found that heat therapy significantly reduced menstrual pain among adolescents and young adults

The shift in pain distribution from moderate to mild categories after the intervention further demonstrates the clinical effectiveness of warm compresses. This mechanism is closely related to the gate control theory, wherein thermal stimulation reduces the transmission of pain signals to the central nervous system (Lin and Chen 2024),indicated that heat application modulates peripheral nerve activity, thereby diminishing the perception of pain.

From a reproductive health education perspective, the use of warm compresses holds substantial practical value in university settings. Students can independently perform this

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intervention without the need for specialized equipment, making it highly suitable for campus-based health promotion programs. Marván and Castillo-Luna (2020) found that self-management strategies positively improve students' ability to cope with dysmenorrhea without relying on pharmacological agents

Overall, this study affirms that warm compress therapy is an evidence-based, effective option for reducing primary dysmenorrhea severity. These findings provide a foundation for integrating heat therapy into reproductive health education, particularly within midwifery programs.(Cor et al. 2024). similarly recommend simple, safe, and low-cost interventions as primary approaches to alleviate dysmenorrhea among adolescents and university women

CONCLUSION

This study demonstrates that warm compress therapy is an effective non-pharmacological intervention for reducing the intensity of primary dysmenorrhea among adolescent students. The findings indicate that younger respondents, particularly those in early adolescence, tend to experience more pronounced menstrual pain due to hormonal fluctuations and physiological maturation of the reproductive system. Factors related to menstrual characteristics, such as irregular cycles and prolonged duration, further contribute to increased pain severity. Although genetic predisposition was minimal among the respondents, lifestyle factors—including stress, inadequate physical activity, and poor sleep patterns—emerged as potential contributors to dysmenorrhea symptoms.

The significant reduction in pain scores following the application of warm compresses, supported by the Wilcoxon test results, underscores the clinical utility of heat therapy in alleviating uterine muscle spasms and modulating nociceptive pathways. The shift from moderate to mild pain categories after the intervention confirms both its physiological and practical effectiveness. Given that warm compresses are simple, safe, low-cost, and easy to apply independently, this intervention holds considerable promise for integration into reproductive health education and campus-based self-care programs.

Overall, the study reinforces the relevance of warm compress therapy as a viable, evidence-based approach to managing primary dysmenorrhea. Educational institutions, particularly those in health sciences, are encouraged to promote this method as part of comprehensive menstrual health management to enhance students' well-being and academic performance.

SUGGESTION

For Students: It is recommended that students apply warm compress therapy independently as a self-management strategy to alleviate menstrual pain. Regular use of this simple and non-pharmacological intervention can help reduce discomfort during menstruation and improve daily functioning and academic performance and For Future Research: Further studies with larger sample sizes and diverse populations are suggested to validate the effectiveness of warm compress therapy. Comparative studies between different non-pharmacological interventions, such as exercise, acupressure, or herbal remedies, may provide insights into the most effective approaches for dysmenorrhea management

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