



The Effect of Cold Compresses on Dysmenorrhea in Adolescent Women

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A B S T R A C T

Dysmenorrhea, characterized by discomfort during the first or second day of menstruation, can interfere with the activities of adolescent girls. One effective non-pharmacological therapy for dysmenorrhea is the application of cold compresses. This study aimed to analyze the effect of cold compresses on reducing dysmenorrhea pain in adolescent girls at Pesantren At-Tauhid Sidoresmo, Surabaya. The study employed a quasi-experimental design with a one-group pretest-posttest approach using purposive sampling. The sample consisted of 30 adolescent girls from At-Tauhid Sidoresmo Islamic Boarding School who experienced dysmenorrhea. The treatment involved applying a cold compress by filling an ice bag with one-third or half-full of water at a temperature of 15-18°C, applied three times for 10 minutes each. The level of dysmenorrhea pain was measured using the Numeric Rating Scale (NRS), which assesses pain scale from 0 to 10. Data analysis was conducted using the Wilcoxon rank test. The analysis results indicated that $\alpha < 0.05$, with a p value of 0.000, signifying that cold compresses significantly reduce dysmenorrhea pain in adolescent girls at At-Tauhid Sidoresmo Islamic Boarding School in Surabaya. In conclusion, cold compress therapy effectively reduces dysmenorrhea pain and can be considered an alternative therapy for young women experiencing dysmenorrhea without causing side effects.

INTRODUCTION

The problem of dysmenorrhea is often complained of when women go to the doctor; dysmenorrhea usually makes women uncomfortable. This condition gets worse if an unstable psychological condition, such as stress, depression, excessive anxiety, and excessive moodiness or joy, accompany it (Zakiyah, 2015). In Indonesia, the incidence of primary dysmenorrhea is 54.89%, while the rest are sufferers of the secondary type. Based on data from the East Java Province Adolescent Reproductive Health Survey (SKRR) in 2021, it was found that around 4,653 teenagers experienced dysmenorrhea. The incidence of primary dysmenorrhea was 4,297 (90.25%), and 365 people (9.75%) experienced secondary dysmenorrhea. Around 70-90% of cases of menstrual pain occur during adolescence, and those who experience menstrual pain will be affected by academic, social, and sports activities (Al Asadi, Jasim & Qader, 2013).

Based on a preliminary survey conducted at the At-Tauhid Sidoresmo Islamic Boarding School, Surabaya, in February 2023, through the interview method, it was found that out of 40 teenage girls, 32 of them experienced menstrual pain, resulting in them not attending boarding school activities or school activities because of the pain. Felt. Young women usually overcome this by resting, drinking water, and smearing it with eucalyptus oil.

Factors that cause dysmenorrhea are early menarche, long menstrual period, parity, exercise, choice of contraceptive method, family history, psychological factors, constitutional factors, cervical canal factors, and endocrine factors. The impact of dysmenorrhea on young women can disrupt comfort, interpersonal relationships, sleep patterns, decreased appetite and activity, and difficulty focusing on work and learning (Kusmiran, 2016).

Efforts that can be made to reduce pain usually use pharmacological management, such as using anti-inflammatory drugs (NSAIDs). Still, the side effects of these drugs, if used freely and repeatedly without a doctor's supervision, can pose a risk that is harmful to the body. So, as an alternative, safe complementary therapy is given, namely non-pharmacological treatment, one of which is cold compresses.

Cold compresses can be placed on areas that feel pain. Usually, the waist, lower abdomen, or thigh crease when contractions are using a cold bladder filled with cold water at a temperature of 15-18°C for 5-10 minutes, and the pain of dysmenorrhea can also be overcome by applying a warm compress. Applying a cold compress is thought to increase the divestment of endorphins, which block the transmission of pain stimuli and stimulate large diameter A-Beta nerve fibers—as a result, reducing the transmission of pain impulses through tiny A-delta fibers and C nerve fibers (Seingo et al., 2018). Apart from reducing pain sensation, cold compresses also have a physiological impact, such as lowering tissue inflammatory response, blood flow, and edema (Malanga, 2014).

Based on the description above, the researcher wants to clarify the results of previous research again. Therefore, this research aims to analyze the relationship between cold compresses and reducing the scale of dysmenorrhea because cold compresses function to reduce inflammation by constricting or shrinking blood vessels. In cold compresses, transferring pain perception to a more dominant cold feeling is one type of transcendence achieved so that respondents feel more comfortable. Therefore, cold compresses are believed to reduce muscle tension (Shao, 2017).

METHOD

Population and Location

The population of pregnant women in the third trimester at the Jagir Surabaya Community Health Center is 44 pregnant women in the third trimester. The sample in this study consisted of 40 respondents who were taken using the techniques of consecutive sampling.

This research uses a pre-experimental approach, namely, a one-group pretest-posttest design. The population of this study was all young women who experienced dysmenorrhea pain at the At-Tauhid Sidoresmo Surabaya Islamic boarding school, totaling 32 respondents. The sample for this study was a portion of young women who experienced dysmenorrhea pain at the At-Tauhid Sidoresmo Islamic

Boarding School in Surabaya who met the inclusion criteria, namely willing to be respondents, willing to be given cold compresses and currently experiencing primary dysmenorrhea. In contrast, the exclusion criteria were teenagers who had allergies to colds and took analgesics, experienced secondary dysmenorrhea. The sample size was calculated using the Slovin formula of 30 respondents. The sampling technique in this research uses probability sampling using purposive system sampling.

Data collection procedures

In this study, the research instrument used to implement cold compresses is the SOP for cold compresses using a compressor in the form of an ice bag (*buli-buli*) and a temperature measurement tool using a thermometer. In contrast, the instrument used for measuring dysmenorrhea pain is an observation sheet with an NRS assessment (Numeric Rating Scale).

Data collection in this research was carried out in several stages, namely, the preparatory stage. Before conducting the research, the researcher asked for a letter of initial data collection from the educational institution Nahdlatul Ulama University, Surabaya. After obtaining a letter of introduction for initial data collection from the educational institution UNUSA, then the researcher submitted a permission letter to the head of the At-Tauhid Islamic boarding school Sidoresmo Surabaya; after receiving permission, the researcher coordinated with the caretaker of the At-Tauhid Islamic boarding school to request data on the number of young women. The researcher will conduct an ethical suitability test by the Research Ethics Commission at Chakra Brahmanda Lentera. Implementation Stage: Approaching young women, explaining to young women the aims and benefits of research, young women who are willing to sign a consent form that they are willing to apply cold compresses (informed consent), Observe the pain scale in young women before cold compress intervention is carried out, Apply a cold compress for 10 minutes with a temperature of 15-18⁰C, three times when experiencing dysmenorrhea pain. After applying a cold compress, observation was carried out using the NRS pain scale. Then, data collection was carried out, and data analysis continued.

Data Analysis

The analysis used in this study to determine the effect of cold compresses on dysmenorrhea pain in young women used a Wilcoxon Signed Rank Test.

RESULT

General data

1) General characteristics of respondents based on age of first menstruation (*menarche*)

Table 1 Frequency Distribution of Respondents Based on Age of First Menstruation (*menarche*) Young Women at the At-Tauhid Islamic Boarding School in June 2023

No	Menarche Age	Frequency (n)	Percentage (%)
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1	12 years old	6	20
2	13 years old	13	43,3
3	14 years	8	26,7
4	15 years	3	10
Amount		30	100

Based on Table 1, almost half of the respondents were 13 years old, with a total of 13 respondents (43.3%).

2) General characteristics of respondents based on length of menstruation

Table 2 Frequency Distribution of Respondents Based on Age of First Menstruation (*menarche*) Young Women at the At-Tauhid Islamic Boarding School in June 2023

No	Length of Menstruation	Frequency (n)	Percentage (%)
1	< 4 days	4	13,3
2	4-7 days	20	66,7
3	> 7 days	6	20
Amount		30	100

Based on Table 2, almost half of the respondents have a menstrual period of 4-7 days, with a total of 20 respondents (66.7%).

3) General characteristics of respondents based on Family History

Table 3 Frequency Distribution of Respondents Based on Family History at At-Tauhid Islamic Boarding School in June 2023

No	Family History	Frequency (n)	Percentage (%)
1	There is	18	60
2	There is not any	12	40
Amount		30	100

Based on Table 3, almost all respondents have a family history, with a total of 18 respondents (60%).

Custom Data

1) Characteristics of menstrual pain scale before and after being given cold compresses to the Family at the At-Tauhid Islamic Boarding School in June 2023

Table 4 Frequency distribution of Menstrual Pain Scale Before (pre-test) and After (post-test) Given Cold Compresses to Young Women at the At-Tauhid Islamic Boarding School in June 2023

Level of Menstrual Pain	Pre-test		Post-test	
	N	%	N	%
No Pain	0	0.0	20	66,7
Mild pain	6	20	7	22,3
Moderate pain	7	56.7	3	10
Severe pain	17	23,3	0	0.0
Total	30	100.0	30	100.0

Table 4 shows that most respondents felt moderate pain before being given a cold compress (56.7%), while others felt severe (23.3%). After applying the cold compress, there was a change or decrease in the pain scale; almost all had no pain (66.7%), and the others experienced mild pain (23.3%).

2) Shapiro Wilk normality test results

Table 5 Shapiro Wilk Normality test results

Menstrual pain	Say	A	Conclusion
PRE-TEST	0,000	0,05	Abnormal
POST-TEST	0,000	0,05	Abnormal

Based on Table 5, the Shapiro-Wilk sign for the pre-test and post-test was 0.000. Based on the normality test decision rule, a signed value <0.05 indicates that the data is not normally distributed. Hypothesis testing will be continued with non-parametric tests using the Wilcoxon test.

3) Wilcoxon test results

Table 6 Wilcoxon test results

Menstrual pain	themselves	a
PRE-TEST POST-TEST	0,001	0,05

Based on Table 1.6, the Wilcoxon sig value is 0.001. Based on the Wilcoxon test decision rule, if the sig value is <0.05 , then H_0 is rejected, which means that it indicates the influence of cold compresses on reducing menstrual pain in young women at the At-Tauhid Islamic boarding school in Surabaya.

DISCUSSION

The characteristics of respondents which are one of the risk factors for primary dysmenorrhea are menarche. *Menarche* is a milestone in female puberty that shows physical growth and maturation of the reproductive system; process menarche confirms that a woman has the hormone estrogen, which causes the growth of the uterus, especially the endometrium (Xiaoshu, 2010). *Menarche* at a very young age can be caused by a family history of early puberty, obesity, tumors in the adrenal glands, and excessive estrogen production. *Menarche* occurs at an earlier age than usual when the reproductive organs are still not ready to change, and there is still a narrowing of the cervix, so pain will occur during menstruation (Proverawati, A dan Misaroh, 2009).

Prolonged menstruation is one of the risks of primary dysmenorrhea. The length of menstruation causes uterine contractions to last longer, resulting in the uterus contracting more frequently and more prostaglandins being released. Excessive production of prostaglandins causes pain, while continuous uterine contractions will cause the blood supply to the uterus to stop, and dysmenorrhea occurs (Sibagariang, E. E., Pusmaika, R., 2019).

Based on the results of statistical tests using the Wilcoxon Sign Rank Test pre-test and post-test of giving a cold compress using SPSS for Windows, it was found that the P value was 0.001 ($0.001 < 0.05$), so H_0 was rejected, which means that there was an effect of giving a cold compress on reducing the level of menstrual pain (dysmenorrhea) in adolescent girls at the At-Tawhid Islamic Boarding School, Surabaya. According to researchers, treating menstrual pain (dysmenorrhea) using non-pharmacology, one of the treatments or treatments is using cold compresses. Cold compresses can be placed on areas that feel pain.

Usually, the waist, lower abdomen, or thigh crease when contractions are using a cold bladder filled with cold water at a temperature of 15-18°C for 5-10 minutes, and the pain of dysmenorrhea can also be overcome by applying a warm compress. Applying a cold compress is thought to increase the divestment of endorphins, which block the transmission of painful stimuli and stimulate large-diameter A-Beta nerve fibers—as a result, reducing the transmission of pain impulses through tiny A-delta fibers and C nerve fibers (Gabeheyu, 2017).

The results of this study are based on research conducted by Malanga (2014), which proves that there is a difference in the pain experienced by respondents before and after being given a cold compress. This proves that cold compresses significantly reduce pain because cold compresses can reduce blood flow to the area. Body experiencing pain. Cold compresses reduce pain intensity due to a person's endorphin levels; the higher the endorphin levels, the lighter the pain felt. Endorphin production can be increased through skin stimulation. A cold compress is one way to stimulate the skin (Malanga, 2014).

This is also supported by research according to Iraman (2018), which states that deep breathing relaxation with a cold compress can reduce menstrual pain (dysmenorrhea), where the cold compress can reduce excess prostaglandin hormones, activate natural endorphins, increase feelings of relaxation and comfort. Cold compresses reduce pain intensity due to a person's endorphin levels; the higher the endorphin levels, the lighter the pain felt. Endorphin production can be increased through skin stimulation. One way to stimulate the skin is by using a cold compress. Endorphins are pain-relieving substances produced by the body (Iraman, Faulus Deby, 2018).

CONCLUSION

Cold compresses significantly reduce dysmenorrhea, so they can be used as a non-pharmacological therapy that is safe to use, does not cause side effects, and can be done at home.

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