

## The Effectivity of Cold Compress and Warm Compress to Intensity Level of Menstrual Pain (Dysmenorrhea)

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### ABSTRACT

#### Introduction

Dysmenorrhea is defined as a painful episode during or just before getting menstruation, it is the most uterine problem for women in any ages. Nonpharmacological treatments to solve the problem include cold and warm compress methods. However, there has no extensive studies found concerning the effectivity of both methods. The aim of the study was to determine the effectiveness of cold and warm compress on intensity level of menstrual pain (Dismenorea).

#### Methods

The research design used Quasy Experiment with Pretest-Posttest approach and applied Purposive Sampling technique. Population in the research was students of FIK Unipdu Jombang with sample 40 respondents and selected based on inclusion and exclusion criteria. The Instrument to measure pain intensity was NRS (*Numeric Rating Scale*), data were analyzed using Paired T-Test and Independent Paired T-Test, with significance level  $\alpha \leq 0,05$ .

#### Results

The results showed that before applying the treatment, the intensity of menstrual pain in both groups were similar ( $p > 0.05$ ). However, after the treatment implementation, it has been found that Intensity of menstrual pain decreased significantly from 5.95 - 2.75 in cold compress group whereas from 6.80 to 3.55 in warm compress ( $p < 0.05$ ). The statistical test results showed that after the treatment, there was no significant difference between cold and warm compress groups ( $2.75 \pm 1.45$  vs  $3.55 \pm 1.19$ ).

#### Conclusion

Cold and warm compress were effective for reducing intensity of menstrual pain and it might an alternative of intervention for reducing menstrual pain.

#### Keywords

Menstruation Pain; Cold Compress; Warm Compress

### INTRODUCTION

Dysmenorrhoea is pain during or shortly before menstruation, it is the most common obstetric problem among women in all ages and including among teenager group. Many teenagers experienced dysmenorrhoea in the first three years after menarche [1]. Commonly,

dysmenorrhoea occur in the first menstruation experience (menarche). Menstruation pain can be decrease after menstruation, but in some women menstruation pain can be continue during or until finished the menstrual period so it will give an impact like unable to do daily activities. Non-pharmacological treatments were more usefull to solve this problem because commonly it was no give negative impact for health. Cold compress and warm compress are one of non-pharmacological treatments for reducing menstrual pain. This effort is an intervention in pain management using cutaneous stimulation techniques. Cutaneous stimulation causes the release of endorphins, thus it will block the transmission of pain stimuli [2]. But so far the differences between cold compresses and warm compresses to decreasing intesity of menstrual pain (dysmenorrhoea) are not yet clearly known.

Dysmenorrhoea is a very common gynecological problem that affects women in childbearing age [3]. An estimates of prevalence was variety across the world, ranging from 56.4% in mainland China, 51% in Turkey, 67% in Sweden, 80% in Western Australia, 85% in Spain, 60-90% in the United States, 73.3% among Taiwanese high school girls (Average age 16.7 years old) [4], 87.8% among students in Turkey [5], 89.1% in Iran [6], 60,9% among female medical students in Kingdom of Saudi Arabia [7], 76% in Malaysia [8] and 60% in Canada (Burnettet al, 2005) in [9]. However, in Indonesia, an estimated at 55% among women who in childbearing age were experienced menstrual pain [10], and 50% of them were reported got mild symptoms, 30% got moderate symptoms, and 20% got severe symptoms [11].

Factors that contribute to dysmenorrhea are include the age of early menarche, increased menstrual bleeding, alcohol and tobacco use, low socioeconomic status, obesity, and depression/anxiety (French L, 2005) in [12]. Moreover, according to Wiknjastro (2007) there are several factors can affect primary dysmenorrhea, including psychiatric factors, constitutional factors, factors of cervical canal obstruction (cervix), factors of endocrine and allergic factors [13]. Primary dysmenorrhoea has a biochemical basis and occurs due to prostaglandin release during menstruation. During the luteal and menstrual phases, prostaglandin F2-alpha (PGF2- $\alpha$ ) was secreted. Excessive loose of PGF2- $\alpha$  will increases the amplitude and frequency of uterine contractions and it can causes vasospasm of the uterine arterioles, causing lower abdominal ischemia and cramps [1] and pain and back [14]. If it is late for handling, the pain will spread to the waist and thighs, followed nausea and vomiting, headaches, diarrhea and sensitive. Menstrual pain was varies from the mild to severe of pain, so this will disturb of daily activities [15]

Treatment of menstrual pain (dysmenorrhoea) can be using pharmacologically and non-pharmacologically method. Commonly, pharmacological interventions for reducing pain are including nonsteroidal anti-inflammatory drugs (NSAIDs) and oral contraceptive pills. Although it was useful and effective reducing menstrual pain but it also give effects like drug dependence and also unnecessary costs [16,17], diarrhea, abdominal pain, nausea [18], kidney complications, liver complications, sleep disorders [19], digestive disorders [20]. Commonly, pharmacological treatment of dysmenorrhea is successful, but the failure rate is 20-25% [12]. Non-pharmacological treatments for dysmenorrhea include cold compresses and warm compresses. Cold compresse is ice therapies that can reduce prostaglandins which is it has

function for strengthening pain and other subcutaneous in injury places by inhibiting the inflammatory process. This is because cold compresses can reduce blood flow to a part and reduce bleeding edema so it will give analgesic effects by using slow down the speed of nerve delivery so pain impulses will reach the brain with less quantity [21].

Warm compresses with hot jars cause conduction, where there is transfer of heat from the bladder into the body so make dilation of blood vessels and decreased muscle tension and in end dysmenorrhoea pain will decrease or disappear [2]. Skin stimulation causes endorphins loose, than it will blocking the transmission of pain stimulus. The gate control theory said that skin stimulation can activates nerve fibers of A-Beta with faster transmission. This process will decrease the transmission of pain through C and delta-A fibers with small in diameter so the synapse gate will close the transmission of pain implus [2]. Based on the phenomenon, researchers are interest and would like to take this study with the title "The Effectiveness of Cold Compresses and Warm Compresses to Decreasing Menstrual Pain Intensity (Dysmenorrhea)".

## **METHODOLOGY RESEARCH**

The research design used was Quasy Experiment with Pretest-Postest Design. The population in this study was all students in Faculty of Health Science in Unipdu Jombang who experienced menstrual pain (dysmenorrhoea). The sample size in this study was 35 respondents who met the inclusion and exclusion criteria. The inclusion criteria in this study were: 1) Students who experienced primary dysmenorrhoea; 2) Students who not received anti-pain therapy; 3) Cooperative students. While the exclusion criteria in this study were: 1) Students who experienced secondary dysmenorrhoea; 2) Students who are in the middle of refusing the treatment. The sample in this study was divided into two groups: cold compress group (n = 20) and warm compress group (n = 20). The sampling technique used purposive sampling. Thermometer used to measure the temperature. Moreover, the instrument to use warm compress is a hot jar and ice bag for cold compress. NRS (Numeric Rating Scale) used to measure the pain level. Data were analyzed by using Paired Sample T-Test and Independent Sample T-Test with  $\alpha$  5 0.05.

## **RESULTS**

Characteristics of respondents in this study include: 1) Age; 2) Age of menarche; 3) Menstruationl Cycle; 4) Menstrual Duration; 5) Amount of menstruation; 6) Pain characteristic; and 7) How to copewith pain, as shown in Table 1.1.

Based on table 1.1 shows that the characteristics of respondents in both groups are comparable. The results of the homogeneity test of variables shows that all respondents' characteristics in both groups do not have significant differences with a significance level of  $p > 0.05$ . Thus one of the research requirements has been fulfilled, because the characteristics of the subjects in both groups are homogeneous.

**Table 1.1 Characteristics of respondent and Homogeneity**

Variable	Cold compress	Warm compress	P value
	Mean (SD)		
1. Age (years)	20 (1,52)	20,65 (0,93)	0,435
2. Age of Menarche (years)	12,90 (1,12)	13,20 (1,36)	0,570
3. Menstruation duration (day)	7,35 (1,14)	7,55 (1,23)	0,664
N (%)			
4. Menstruationl Cycle			
a. Regular	10 (50)	11 (55)	1,000
b. Irregular	10 (50)	9 (45)	
5. Amount of menstruation			
a. Moderate	11 (55)	9 (45)	0,85
b. Much	9 (45)	11 (55)	
6. Pain characteristic			
a. Burnt	1 (5)	0 (0)	0,337
b. Cramps	4 (20)	5 (25)	
c. Twisting	9 (45)	7 (35)	
d. Oppressed	6 (30)	4 (20)	
e. Acute	0 (0)	4 (20)	
7. How to copewith pain			
a. Take medicine	2 (10)	1 (5)	0,435
b. Take a rest	15 (75)	14 (70)	
c. Ignore	3 (15)	5 (25)	

Source: Primary data, 2018

The intensity of menstrual pain before giving treatment in the group of cold compresses and warm compresses is comparable ( $p > \alpha$ ), as shown in table 1.2 below.

**Table1. 2 Intensity of Menstrual Pain (Dysmenorrhea) Before giving Treatment**

Group	Mean	SD	Beda Mean (95% CI)	p
Cold compress	5,95	1,54	-0,85 (-1,76 – 0,06)	0,065
Warm compress	6,80	1,28		

Source: Primary data, 2018

The intensity of menstrual pain after giving cold compresses and warm compresses for 20 minutes, obtained the average value of menstrual pain intensity as shown in Table 1.3.

**Table 1.3 Intensity of menstrual pain (Dismenorea) after giving treatment**

Group	Mean	SD	Beda Mean (95% CI)	p
Cold compress	2,75	1,45	- 0,80 (-1,65 – 0,05)	0,064
Warm compress	3,55	1,19		

Source: Primary data, 2018

**Table 1.4 the differences intensity average of menstrual pain (Dysmenorrhea) before giving treatment and giving after treatment**

Group	Before treatment Mean (SD)	After treatment Mean (SD)	Beda <i>Mean</i> (95% <i>CI</i> )	p
Cold compress	5,95 ± 1,54	2,75 ± 1,45	3,20 (2,73 – 3,67)	0,000
Warm compress	6,80 ± 1,28	3,55 ± 1,19	3,25 (2,82 – 3,68)	0,000

## DISCUSSION

The results of this study showed that the average intensity of menstrual pain (dysmenorrhoea) before giving treatment in cold compress group obtained in moderate intensity. However, in warm compress group obtained the average intensity of menstrual pain at severe intensity. This results was in accordance with the opinion of Turk and Melzack (2011), they said that the intensity of dysmenorrhea pain can be mild, moderate and severe [22]. Mild dysmenorrhoea is lil pain and it does not disturb daily activities and does not require pain medicine, moderate dysmenorrhoea is pain and it can disturb daily activities but it can be managed with pain relief, while severe dysmenorrhoea is pain and completely disturb daily activities. The results of previous studies showed that the average intensity of menstrual pain experienced by respondents in the medium category [23]. Several factors are related with the incidence of dysmenorrhoea such as age and age of menarche, longer duration of menstruation, excess menstrual volume [24, 25, 26].

Dysmenorrhoea can be occur among adolescents and young women, in this study showed that the age of respondents in both groups are in adolescents, where the average age in cold compress group was 20 years old and the average age in warm compress group was 21 years old. The results of this study was in accordance with the result of previous study which showed that the average age of respondents who experienced dysmenorrhoea was 21 years old [27], and also in accordance with Perry et al (2010), he stated that dysmenorrhoea was the most and common gynecological problem in women, especially at the age of 17 to 24 years old [28]. The average age of menarche respondents in both groups were 13 years old. Age of menarche in this study was normal menarche category, it is in range 12-16 years old [29]. The result of previous study also showed that the age of menarche respondents who experienced dysmenorrhea was 13 years old on average [30]. The age of menarche was related with the intensity of menstrual pain for dysmenorrhoea [31]. The intensity of menstrual pain in respondents who experience early menarche (age 9-11 years) was higher than the respondents with normal age menarche. This is consistent with previous studies which show that women with early menarche are disposed to get severe dysmenorrhoea [32].

Menstrual duration is one of the factors that affect dysmenorrhoea. The average menstrual duration is 5 days (range 3-6 days) [28]. The results of this study showed that the average of menstrual duration in both groups were obtained more than 7 days, this could increased the risk of dysmenorrhea. Menstrual cycle of respondents in this study obtained the half of cold compress group was regular. However, in warm compress group most menstrual cycles were

irregular. Respondents with irregular menstrual cycles showed that the intensity of menstrual pain was higher compared with regular menstrual cycle respondent. Women who have irregular menstrual cycles will increase the risk of dysmenorrhoea [33]. The amount of menstruation in cold compress group was in moderate level, the amount of menstruation in warm compresses group was mostly large. Heavy menstrual bleeding will increase the risk of dysmenorrhoea [34]

The results of this study showed that the average intensity of menstrual pain in cold compress group was significant decrease range from 5.95 to 2.75. The results of paired sample t-test showed that there was a significant effect of cold compress to decreasing the intensity of menstrual pain (dysmenorrhoea). This decrease occurred if a cold compress was given by using an ice bag and put it on the abdomen for 20 minutes. Providing cold compress will make the respondent feel immune, this is because cold compresses can reduce blood flow to a part and reduce bleeding edema which is it will give analgesic effects by slowing the rate of nerve delivery so the pain impulses will less reach to the brain [21] and perception of pain will decrease. Cold therapy will give affect the impulses carried by tactile fibers A-Beta to dominate so the "gate" will close and the pain impulses will be blocked. Pain will be reduced or disappear for a while [35] The results of this study were in accordance with previous studies which stated that cold compress was effective to reduce the intensity of menstrual pain (dysmenorrhoea) [36, 37, 38]. Giving cold compresses can also reduce the pain at perineal wounds in postpartum mothers [39].

The average intensity of menstrual pain after giving warm compresses experienced a significant decrease, ranged from 6.80 to 3.55. The results of paired sample t-test showed that there was a significant effect of warm compress to reduce the intensity of menstrual pain (dysmenorrhoea). This decrease occurred if warm compresses were given by using a bag with warm water with a temperature of 40-45 C° and put it on the abdomen for 20 minutes. Giving warm compress to respondents can help reduce pain, because it will make enlarge the blood vessels (vasodilation) and will increase blood supply throughout the body, besides that it can also provide comfort to the respondents [Steven 2007] in [40] so it can stimulate to release the endorphin  $\beta$  homon. The results of previous studies indicated that warm compresses was effectively to reducing the intensity of menstrual pain [41, 42]

The results of Independent Sample T-Test showed that after given treatment there was no significant difference in the intensity of menstrual pain in cold compresses group and warm compresses group ( $p > 0.05$ ). This analysis shows that cold and warm compress are equally effective to reducing the intensity of menstrual pain. Cold compress and warm compress are techniques for cutaneous stimulation. The mechanism of the technique of cutaneous stimulation in reducing pain can be explained according to the gate control theory. The gate control theory said that skin stimulation will activate the sensory and transmission of A-Beta sensory nerve fibers. This process will decrease the transmission of pain through C and delta-A fibers with small diameter so that the synapse gate closes the transmission of pain implus. Cutaneous stimulation will stimulate peripheral fibers to send impulses to the dorsal horn in spinal cord, when the impulses carried by A-Beta fibers dominate the gate mechanism, so the

pain impulses were not delivered to the brain [35]. Providing cold and warm compresses adjusted to tolerance for every woman who has menstrual pain, if a woman has cold allergy, it should be given a warm compress and if a women has warm allergy, it should be given a cold compress, if the woman are more comfortable with a cold compress then the intervention can be given.

### **Research Limitations**

The application of cold compresses and warm compresses in this study were carried out only when occurred menstrual pain and this intervention was taken every get menstrual pain, future research should be more efforts to prevent or decrease dysmenorrhoea in the long term.

## **CONCLUSION AND RECCOMENDATION**

Cold compresses using ice and warm compresses with a temperature of 40-45 C<sup>0</sup> are effective to reducing the intensity of menstrual pain so it can be used as an alternative non-pharmacological intervention for treatening menstrual pain.

### **Declarations**

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#### **Ethical Research**

This study has obtained ethical clearance from Nursing Faculty ethics committee of Airlangga University, Surabaya.

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