Warm-Compress Effect on the Pain Level and the Length of Dysmenorea

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Abstract. Background: Dysmenorrhea is a gynecological discomfort due to an imbalance of the hormone progesterone in the blood, causing pain that most often occurs in menstruation period. Giving a warm compress uses the principle of heat delivery through conduction, by attaching a hot bladder to the stomach for a heat transfer and results in pain reduction of primary dysmenorrhea among women.

Objective: Knowing the effect of warm compresses on changes in pain levels and the length of dysmenorrhea.

Methods: This study uses a quantitative method, with a pre-experimental one group pretest-posttest design. The sampling technique was a Consecutive Sampling method with a sample of 62 people. The warm compress was done by filling up a rubber bag with hot water, and pressing it slowly on the inflicted-part of the stomach for 10 min. Data collection with warm compress intervention. The data analysis was done by employing a paired t-test.

Result: There is an effect of warm compresses on pain level and duration of dysmenorrhea. The results showed the level of pain before being given an intervention with a warm compress was an average of 6,84 and after the treatment was 2,90, and the length of dysmenorrhea before the treatment was an average of 17, 39 and after it was only 8,92. The analysis on the pain level and duration of dysmenorrhea obtained p-values of each (p-value 0.000 ($p < 0.05$)). Thus, it indicated that there is a significant difference of the pain level between before and after the treatment.

Conclusion: Interventions using warm compresses have an effect on changes in pain levels and the duration of dysmenorrhea during menstruation.

Keywords: Warm compresses · Dysmenorrhea pain · Pain level · Pain period

1 Introductiom

A menstrual pain (dysmenorrhea) is a gynecological discomfort due to an imbalance of the hormone progesterone in the blood, resulting in pain that most often occurs in women. Women who experience dysmenorrhea produce 10 times more prostaglandins than their counterpart. Prostaglandins cause increased uterine contractions, and its excess levels will activate the large intestine (Ernawati, 2010).

I. Permana and E. Rochmawati (Eds.): ICOSI-HSN 2022, 55, pp. 183–190, 2022.
https://doi.org/10.2991/978-94-6463-070-1_23

Based on the World Health Organization (WHO), the amount of dysmenorrhea in the world is very large; on average more than 50% of women in each country experience a dysmenorrhea. In Sweden it is experienced by 72% of women there. In the United States, it is estimated that almost 90% of women have this experience. Among 10–15% of them even have a severe dysmenorrhea, which has caused them unable to do any activities (Medicine, 2013).

The impacts of a dysmenorrhea, if not well treated, is a disruption of activities of daily life, a menstruation retrograde (the one that moves backwards), infertility and infection. Apart from these impacts, emotional conflict, tension and anxiety can all play a role in inflicting a discomfort and an alienation (Syafrudin, 2011).

In general, the management of dysmenorrhea pain is divided into two categories, i.e., pharmacological and non-pharmacological approaches. Non-pharmacological approach includes warm compresses or warm baths, massage, physical exercise, adequate sleep, hypnotherapy, distractions such as listening to music and relaxation (Lusa, 2010).

Giving a warm compress is an independent action. The warm effect of the compress can cause a vasodilation in the blood vessels which will increase blood flow to the tissues. The distribution of acids and food to the cells is enlarged and the elimination of substances is improved which can reduce the primary pain of menstruation due to an insufficient blood supply to the endometrium (Natali, 2013).

Seeing the description above, we know that it is important to treat dysmenorrhea by applying a warm compress. It needs a proper understanding in the intervention of warm compresses.

Based on the description above, we are interested in examining the effect of warm compresses on changes in pain levels and the duration of menstrual pain (dysmenorrhea) among nursing students in the Faculty of Health Science, University of Muhammadiyah Purwokerto.

2 Research Method

This study employed a quantitative method, with a pre-experimental one group pretest-posttest design approach. The subject group was observed before and after the intervention was given (Sugiyono, 2018). This study is to determine the effect of the intervention carried out, namely the effect of warm compresses on changes in pain levels and the duration of menstrual pain (dysmenorrhea). The study was conducted in April-May 2021 on 62 undergraduate nursing students, the Faculty of Health Science, UMP. The sampling technique used a consecutive sampling. The sampling was based on inclusion and exclusion criteria. The inclusion criteria were female students who experienced dysmenorrhea on the 1st or 2nd day and were willing to be respondents. Meanwhile, the exclusion criteria were those who applied analgesic drugs (drugs, drinks or herbs) and had wounds in the abdominal area. The research instrument used a warm compress SOP and the instrument for pain used the Numeric Rating Scale (NRS). The data analysis used a Wilcoxon test.

3 Result

Based on the data analysis, it was identified the results as follows:

3.1 Characteristics of Respondents

The following is a general figure of their characteristics based on their age, their first menstrual age, the duration of menstruation, and duration of dysmenorrhea.

Age. As seen on Table 1 above, among 62 respondents, the lowest number of respondents was 18 years old (2 subjects or 3.2%), and the highest was 21 years (26 or 41.9%).

First Age Menstruation. Table 2 shows the distribution of their first menstruation. Among 62 respondents, the youngest of the first menstruation was 9, 10, and 16 years, each with a percentage of 1 respondent (1.6%), and most respondents (19 respondents or 30.6%) had their first menstruation at 14.

Table 1. Age of respondents.

Age	F	%
18 ys	2	3,2
19 ys	5	8, 1
20 ys	9	14,5
21 ys	26	41,9
22 ys	14	22,6
23 ys	6	9,7
Total	62	100

Table 2. First age menstruation of respondents.

Menstruation Age	F	%
9 ys	1	1,6
10 ys	1	1,6
11 ys	3	4,8
12 ys	15	24,2
13 ys	16	25,8
14 ys	19	30,6
15 ys	6	9,7
16 ys	1	1,6
Total	62	100

Table 3. Menstruation length of respondents.

Menstruation length (days)	F	%
4	1	1,6
5	5	8, 1
6	5	8, 1
7	33	53,2
8	10	16, 1
9	3	4,8
10	3	4,8
14	2	3,2
Total	62	100

Table 4. Dysmenorrhea duration.

Dysmenorrhea Duration (hours)	F	%
1	1	1,6
2	4	6,5
3	3	4,8
4	3	4,8
5	11	17,7
6	2	3,2
8	2	3,2
9	1	1,6
10	2	3,2
12	6	9,7
18	1	1,6
24	16	25,8
30	1	1,6
48	9	14,5
Total	62	100

Menstruation Length (days). Based on Table 3, it showed that respondents with a minimum length of menstruation, namely 4 days, was 1 respondent or 1,6%, and a maximum of 7 days was 33 subjects (53.2%).

Duration of menstrual pain/pre-intervention dysmenorrhea duration

Table 4 shows that the minimum duration of pre-intervention dysmenorrhea extended in 1, 9, 18, and 30 h with a subject (1.6%) in each, and the maximum duration was 24 h, experienced by 16 subjects (25,8%).

Table 5. Dysmenorrhea duration.

Dysmenorrhea Duration (hours)	F	%
1	4	6,5
2	9	14,5
3	12	19,4
4	1	1,6
5	2	3,2
6	2	3,2
7	1	1,6
8	5	8,1
9	1	1,6
10	5	8,1
11	4	6,5
12	4	6,5
17	2	3,2
21	1	1,6
22	2	3,2
23	1	1,6
24	4	6,5
25	1	1,6
28	1	1,6
Total	62	100

Table 6. Dysmenorrhea duration.

Treatment	N	Min	Max	Mean	Sd
Pre-intervention	62	3	10	6,84	1,393
Post Intervention	62	0	7	2,90	1,169

Post-interventional dysmenorrhea duration

Table 5 shows that the minimum duration of post-intervention dysmenorrhea was 4, 7, 9, 21, 23, 25, and 28 h, each with a respondent (1,6%), and the maximum duration of post-intervention dysmenorrhea was 3 h in 12 subjects (19.4%).

3.2 Pain Levels Between Pre- and Post-intervention of Warm Compress

Based on Table 6, it is known that the average pain level among the respondent at the pre-intervention was a mean of 6.84% with the lowest minimum value, with the highest maximum value (10), with standard deviation (SD) of 1.393. Meanwhile, the pain level of respondents after the warm compress intervention tended to decrease, namely the

Table 7. Normality test.

Variable	*p value*	Note
Pain level of Pre-intervention	0.000	Not Normal
Pain level of Post-intervention	0.000	Not Normal
Duration of dysmenorrhea in Pre-invention	0.000	Not Normal
Duration of dysmenorrhea in Post-invention	0.000	Not Normal

Table 8. Distribution of warm compress effect on changes of the pain level

Intervention	Mean (min-max)	Z	*p value*
Pre Intervention	6.84 (3–10)	– 6.915	0.000
Post Intervention	2.90 (0–7)		

mean (2.90), with the lowest minimum value (0), the highest maximum value (7), with an SD of 1.169.

3.3 Normality Test

The results of the normality test can be seen in Table 7. The Kolmogorov test gives a significant value of pre-intervention and post-intervention 0.000 for each. The significant value of the pre-intervention and post-intervention is < 0.05. It can be said that the data is not normally distributed. Thus, the test used is the Wilxocon test (Table 8).

3.4 Effect of Warm Compresses on Changes in Pain Level and Duration of Dysmenorrhea

Based on Table, the average value in the pre-intervention group was 6.84, while in the post-intervention group it was 2.90. Based on the result of Wilxocon test, a value of 0.000 is obtained, which means p-value is < 0.05. Thus, Ho is rejected and Ha is accepted. It means there is a significant difference of the pain level of dysmenorrhea between pre- and post-intervention time among the students treated with warm compresses. It proves that the average level of dysmenorrhea pain among the subjects after the warm compress intervention is 2.90; it is much lower than the average level of dysmenorrhea pain before the intervention, which is 6.84.

3.5 The Effect of a Warm Compress on the Duration of Dysmenorrhea

Based on Table 9 above, it was obtained that the average value in the pre-intervention group is 17.39, while in the post-intervention group it is 8.92. Based on the results of the Wilxocon test, a value of 0.000 is obtained, meaning p-value is < 0.05. It means that Ho is rejected and Ha is accepted. Thus, there is a significant difference of the duration

Table 9. The effect of a warm compress

Treatment	Mean (Min-Max)	Z	*p-value*
Duration of dysmenorrhea pre-intervention	17.39 (1–48)	– 6.632	0.000
Duration of dysmenorrhea postintervention	8.92(1–28)		

of dysmenorrhea pain between pre- and post-intervention time among the subjects. The results showed that the average length of dysmenorrhea among the subject after the warm compress intervention is 8.92, which is much shorter than the average length of dysmenorrhea at pre-intervention period, which is 17.39.

4 Discussion

The effect of warm compresses on changes in pain level and duration of dysmenorrhea, based on the results of the study, it is proven that there is a difference between the menstrual pain scale (dysmenorrhea) and its duration before and after the treatment of warm compress.

Dysmenorrhea pain can be reduced by non-pharmacological therapy of warm compresses, namely providing a sense of security to subject by applyng fluids or tools to provide a warmth on the corresonding part of the body. This results in a heat transfer to the abdomen so that it becomes warm, resulting in a dilation of the blood vessels in the abdomen area. This in turn increases blood flow in the area so that the dysmenorrhea pain can decrease or disappear. Non-pharmacologically, the treatment is very useful in reducing dysmenorrhea pain through muscle relaxation and reduces uterine ischemia. Thus, the pain can be reduced or eliminated. This is proved in the results showing that before the treatment, many female students had a moderate to severe pain scale and their pain decreased after it. Thus, warm compresses are very effective and efficient in reducing dysmenorrhea pain because they do not require a lot of money, time, and much physical work. However, it should be applied with a good care as a hot water may lead into an irritation on the skin (Lowdermilk, et al. (2013)).

The result is in line with Sophia' (2013) work showing that there is a correlation between level and duration of the dysmenorrhea pain; the level of pain is significantly related to the incidence of dysmenorrhea. The higher the pain scale occurs, the more often the uterus contracts, lengthening the pain period. In accordance with Bobak (2004), longer normal menstrual periods lead to more frequent uterine contractions, causing more prostaglandins secreted. An excessive production of prostaglandins can cause an excessive dysmenorrhea pain.

Based on the results of the study and existing theories, It can be summed that there is an influence of warm compress on changes in pain levels and the duration of dysmenorrhea.

5 Conclusion

The characteristics of the respondents are: their age is mostly 21 years old, their age of menarche mostly is 14 years old, their menstrual period is mostly 7 days, their dysmenorrhea pain duration is mostly 24 h. Before the treatment, their average pain scale is 6.84 at the reliability level of 95%, with the lowest pain scale of 3 and the highest of 10. After the treatment, the average pain scale is 2.90 at the reliability level of 95%, with the lowest scale of 0 and the highest of 7. There is an effect of giving warm compresses to the decreasing the level of dysmenorrhea among the subjects with a p value of 0.000 ($\alpha = 0.05$) with an average pre-intervention value of 6.84, and the post-intervention of 2.90. There is an effect of giving warm compresses to the duration of dysmenorrhea pain with p value of 0.000 ($\alpha = 0.05$) with an average pre-intervention value of 17.39, and the post-intervention of 8.92.

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