THE EFFECT OF WARM RED GINGER COMPRESS ON DYSMENORRHEA PAIN SCALE IN FEMALE STUDENTS OF IKES PAYUNG NEGERI PEKANBARU

Widya Tri Juliza[1*], Yureya Nita[1], Veni Dayu Putri[1], Dendy Kharisna[1], M. Zul Irfan [1]
[1]Payung Negeri Health Institute Pekanbaru, Faculty of Nursing, Professional Nurse Program, Pekanbaru, Indonesia
***Corresponding author: widyaajul19@gmail.com**

Abstract

Dysmenorrhea is a condition of menstrual pain that can interfere with daily activities. One of the non-pharmacological methods used to treat dysmenorrhea pain is a warm compress of red ginger. red ginger. This study aims to determine the effect of warm compress warm compress on dysmenorrhea pain scale in female students of the Institute of Health Payung Negeri Pekanbaru. This study used a quasi-experimental design with pre-post test without control group, which involved 141 respondents. Measurement of pain measurements were made before and after the administration of warm red ginger compresses using the Numeric Rating Scale (Numeric Rating Scale). using Numeric Rating Scale (NRS). Results The results showed that there was a significant decrease in the pain scale after being given the intervention with average value of pre-test 4.84 and post-test 3.19. Wilcoxon Signed Rank test test shows a p value = 0.000 (<0.05), which indicates that there is a significant effect on the pain scale after the intervention. indicates that there is a significant effect between warm compresses of red ginger with a decrease in dysmenorrhea pain scale. The conclusion of this study is that warm compresses of red ginger are effective in reducing the pain scale of dysmenorrhea and can be used as an alternative alternative non-pharmacological therapy that is simple and safe.

Keywords: Dysmenorrhea; Menstrual Pain; Warm Compress; Red Ginger

INTRODUCTION

Adolescence is marked by the onset of puberty, which is the initial stage of sexual maturation, namely a period in which a child undergoes physical, hormonal, and sexual changes and becomes capable of reproduction. In adolescent girls, puberty is periodically characterized by a reproductive event called menstruation (Umboro, Apriliany and Yunika, 2022). Menstruation is the shedding of the uterine lining each month in a woman. Menstruation is also known as menses, the menstrual period, or the menstrual cycle. Menstrual blood consists of blood and tissue that come from inside the uterus and pass through the cervix and out of the body through the vagina (Mutair and Jahan, 2022).

Dysmenorrhea is one of the conditions experienced by women during menstruation. Dysmenorrhea is a painful condition that can interfere with daily activities. It is a symptomatic condition that includes abdominal pain, cramps, and backache. The pain in dysmenorrhea is thought to be caused by an increased production of prostaglandins during menstruation, which causes the uterus to contract with greater intensity than usual (Kusuma, Hikmanti and Yanti, 2023).

The impact of dysmenorrhea disrupts activities, and when it is severe it can cause nausea, vomiting, and diarrhea. Dysmenorrhea affects daily activities, including difficulty concentrating, emotional conflict, discomfort, decreased activity, and limitations in activities caused by dysmenorrhea pain (Karlinda, Oswati Hasanah and Erwin, 2022). Increased production and release of prostaglandins from the endometrium during menstruation cause uncoordinated and

irregular uterine contractions, resulting in dysmenorrheic pain (Nugraheni, Puspitasari and Prajayanti, 2024).

There are two ways to reduce dysmenorrhea pain, namely pharmacological and non-pharmacological therapy. Pharmacological therapy can be carried out by administering analgesic drugs such as ibuprofen, mefenamic acid, and others (Khotimah and Lintang, 2022). However, excessive use may have side effects such as gastric disorders. Non-pharmacological therapy can be performed in various ways, such as music therapy, lavender aromatherapy, abdominal stretching exercises, deep relaxation, acupressure, herbal treatments, exercise, and traditional remedies derived from plant-based ingredients that are believed to reduce pain, such as cloves, red ginger, green coconut water, and others (Sari *et al.*, 2023).

Red ginger is known as a type of herbal remedy that is effective in relieving menstrual pain due to its anti-inflammatory properties. The mechanism of action of red ginger is by inhibiting the activity of the cyclooxygenase enzyme, which plays a role in the production of prostaglandins, namely compounds that trigger inflammation and pain (Siagian and Ritonga, 2021). In addition, warm water also has a relaxing effect on the muscles, which can help relieve abdominal cramps during menstruation. The combination of the anti-inflammatory properties of red ginger and the therapeutic effect of warm water makes it an effective natural solution for reducing menstrual pain (Maulida, Saputra and Ayuni, 2023).

This means that even though two people experience pain of similar severity, the way they perceive it can be very different. Each individual has a different pain threshold, which is influenced by various factors such as pain tolerance, previous experiences, physical condition, and psychological factors. Therefore, the measurement of pain intensity must be carried out by taking these differences into account in order to obtain an accurate picture of each individual's pain experience (Sumiaty, Sakti and Hasnawati, 2022).

RESEARCH METHODS

This study is a quantitative research using a quasi-experimental design with a pre-post test without a control group. The researcher conducted the intervention on only one group without comparison. The effectiveness of the treatment was assessed by comparing the pre-test and post-test results. This study aims to investigate the potential causal relationship by providing a single type of treatment (intervention) in the form of the administration of a warm red ginger compress to the experimental group, and then comparing the results before and after the treatment. Measurements were taken from the respondents before and after the intervention, thereby obtaining two measurement results (pretest and posttest).

This study was conducted at IKES Payung Negeri Pekanbaru. The population of this study comprised all female students of the Payung Negeri Institute of Health in the 2024 academic year, totaling 1,687 individuals. The total sample in this study consisted of 141 female students. The sampling technique used in this study was accidental sampling. The inclusion and exclusion criteria in this study were as follows:

a. Inclusion
1. Female students who were menstruating.
2. Female students who experienced dysmenorrheic pain.
3. Female students who experienced menstruation on days 1, 2, and 3.

b. Exclusion
1. Did not complete the therapy
2. Female students who experienced menstruation on the 4th day and onwards

The research instrument used in this study was the Numeric Rating Scale (NRS), which is a commonly used pain measurement scale designed for patients aged over 9 years. This scale asks patients to rate their pain level using numbers from 0 to 10, where 0 indicates no pain and 10 indicates very severe pain. To ensure the effectiveness of the intervention, the red ginger compress was heated to an optimal temperature of 38–42°C, and its temperature was checked using a heat retention checker (HRC), which showed that the compress could maintain warmth for 25–30 minutes before requiring reheating. The compress was also wrapped in a thin cloth to protect the skin from irritation or burns.

RESEARCH RESULTS

A. Univariate Analysis

1. Characteristics of Respondents

Table 1. Frequency Distribution of Respondents' Ages among Undergraduate Nursing Students of the Faculty of Nursing, IKes Payung Negeri Pekanbaru

	Category	Frequency	Percentage (%)
Age	14–17 Years (Adolescents)	14	9.9
	18–25 Years (Early Adulthood)	127	90.1
	Total	**141**	**100.0**
Day of Menstruation	1st	39	27.7
	2nd	59	41.8
	3rd	43	30.5
	Total	**141**	**100.0**

Source: Primary Data Analysis, 2025

Based on Table 4.1, the age distribution of undergraduate nursing students at the Faculty of Nursing, IKes Payung Negeri Pekanbaru shows that more than half of the respondents were in the early adulthood category, namely 127 people (90.1%). The distribution of respondents based on the day of menstruation shows that more than half of the respondents, 59 people (41.8%), experienced menstruation on the 2nd day.

2. Mean Score of Dysmenorrhea Pain Scale

Table 2. Mean Score of Dysmenorrhea Pain Scale among Undergraduate Nursing Students of the Faculty of Nursing, IKes Payung Negeri Pekanbaru

	N	Mean	SD	Min	Max
Pre Test	141	4.84	1.510	2	9
Post Test	141	3.19	1.314	1	6

Source: Primary Data Analysis, 2025

Based on Table 4.2, the pre-test and post-test results of 141 respondents showed a difference in scores before and after the application of a warm red ginger compress. The mean pre-test score was 4.84 with a standard deviation of 1.510, a minimum value of 2, and a maximum value of 9. Meanwhile, the mean post-test score decreased to 3.19 with a standard deviation of 1.314, a minimum value of 1, and a maximum value of 6. These results indicate that there was a change

in the dysmenorrhea pain scale after the application of the warm red ginger compress, with the mean post-test score being lower than the pre-test score.

B. Test of Normality

If the results of the normality test are not normally distributed, the study is analyzed using an alternative test (Wilcoxon Signed-Rank). The results of the normality test in this study are as follows:

1. Observing the Histogram Curve
   By observing the histogram, the data do not appear to form a symmetrical bell-shaped curve, which means it can be concluded that the data are not normally distributed.
2. Calculating the Skewness Ratio
   Based on the calculation of the skewness ratio, the skewness value of the pre-test divided by the standard error (0.244 ÷ 0.204 = 1.196) and the skewness value of the post-test divided by the standard error (0.099 ÷ 0.204 = 0.485).
3. Calculating the Kurtosis Ratio
   Based on the calculation of the kurtosis ratio, the kurtosis value of the pre-test divided by the standard error (-0.451 ÷ 0.406 = -1.111) and the kurtosis value of the post-test divided by the standard error (-0.602 ÷ 0.406 = 1.483).
4. Kolmogorov–Smirnov
   The Kolmogorov–Smirnov normality test produced a p-value of 0.000 < 0.05 for the pre-test and 0.000 < 0.05 for the post-test; the control pre-test 0.000 < 0.05 and control post-test 0.000 < 0.05. Thus, based on the Kolmogorov–Smirnov normality test, the data were found to be not normally distributed.

C. Bivariate Analysis

Bivariate analysis was carried out to examine the effect of warm red ginger compresses on the dysmenorrhea pain scale among students of the Payung Negeri Institute of Health in Pekanbaru, conducted on February 7–14, 2025, using a pre-test and post-test design. The results of the study were considered effective if the p-value < 0.05. The analysis used to compare the measurement results before and after the administration of the warm red ginger compress was the Wilcoxon alternative test. The Wilcoxon signed-rank test is a nonparametric statistical test used to compare two paired or related groups of data. The Wilcoxon test can be used when the data are not normally distributed (Budiono & Prasetia, 2022). If the Wilcoxon signed-rank statistical test shows a p-value < 0.05, then H0 is rejected, which means that there is an effect of the warm red ginger compress on the dysmenorrhea pain scale among students of the Payung Negeri Institute of Health in Pekanbaru. Conversely, if the Wilcoxon signed-rank test shows a p-value > 0.05, then H0 fails to be rejected, meaning that there is no effect of the warm red ginger compress on the dysmenorrhea pain scale among these students.

Table 3. Distribution of Wilcoxon Signed-Rank Results among Undergraduate Nursing Students of the Faculty of Nursing, IKes Payung Negeri Pekanbaru

	Posttest-Pretest
Z	-9.204
Asymp. Sig. (2-tailed)	0.000

Source: Primary Data Analysis, 2025

Based on Table 4.3, the Wilcoxon Signed-Rank test obtained a Z value of −9.204 with a significance value (Asymp. Sig. 2-tailed) of 0.000. The negative Z value indicates a decrease in pain scores after the application of the warm red ginger compress, suggesting that the warm red ginger compress had a significant effect in reducing the level of dysmenorrhea pain in the study respondents. In addition, the Asymp. Sig. (p-value) = 0.000 plays an important role in determining the significance level of the research results. In quantitative research, if $p < 0.05$, it can be concluded that there is a significant difference between before and after the warm red ginger compress, meaning that the effect of the treatment given is not merely due to chance. In this study, the p-value, which is much smaller than 0.05, indicates that the difference in pain levels before and after the warm red ginger compress is highly significant, and statistically it can be proven that the change that occurred was due to the effect of the warm red ginger compress. In other words, these results confirm that the warm red ginger compress method is effective in reducing dysmenorrhea pain in nursing students who participated as respondents in this study.

DISCUSSION

A. Univariate Analysis

1. Characteristics of Respondents

Based on the research results, the age distribution of undergraduate nursing students at the Faculty of Nursing, IKes Payung Negeri Pekanbaru showed that almost half of the respondents were in the adolescent category, namely 14 people (9.9%), and more than half were in the early adulthood category, namely 127 people (90.1%). This is also supported by the findings of (Wirenviona & Riris, 2020), who stated that late adolescence to young adulthood often experience menstrual problems such as irregular cycles, menorrhagia, and dysmenorrhea, which can affect their daily activities.

According to the researchers' assumptions, the nursing students in this study were within an age range that is still experiencing significant biological and psychological changes that may affect their physical well-being. Therefore, understanding the age characteristics of the respondents is important in assessing the various factors that may influence their menstruation.

Based on the results of the study, the distribution of respondents according to the day of menstruation showed that more than half of the respondents were in category 2, namely 59 people (41.8%). Furthermore, almost half, namely 43 people (30.5%), were in category 3, while category 1 included 39 people (27.7%). These results indicate that the majority of respondents had varying menstrual timing, with category 2 being the largest group.

According to the researchers' assumptions, variations in menstrual timing among the respondents are influenced by the hormonal factors they experience. In addition, irregularities in the menstrual cycle may be associated with reproductive health conditions that require further attention. Therefore, understanding the menstrual characteristics of nursing students can help in providing more effective education and interventions related to reproductive health.

2. Mean Value of Dysmenorrhea Pain Scale

Based on the results of data analysis, there was a difference in the mean scores between the pre-test and post-test. The mean pre-test score was 4.84 with a standard deviation of 1.510, while the mean post-test score decreased to 3.19 with a standard deviation of 1.314. The statistical test showed a p-value of 0.000, which is smaller than the significance level of 0.05. This indicates that there is a significant difference between the pre-test and post-test scores. Thus, it can be concluded that the red ginger warm compress given in this study had an effect on the change in the respondents' post-test scores.

The results of this study are consistent with research conducted by (Fatmawati dan Muliawati,2023) who examined the effectiveness of a decoction of ginger, lemongrass, and dates in reducing the degree of dysmenorrhea pain. This study used a quasi-experimental method with a one-group pretest–posttest design. The results showed a significant difference before and after the application of warm red ginger compresses, with a p-value of 0.000, indicating a significant change in the level of pain experienced by the respondents.

In addition, the study by (Susilawati et al., 2024) also discussed the application of red ginger compress therapy as an effort to reduce pain in individuals with rheumatoid arthritis. This study used a pretest–posttest control group design, in which the majority of participants showed increased knowledge (80%) and had a positive attitude toward the use of warm compresses in reducing pain (70%). These findings reinforce the conclusion that intervention methods based on natural therapies can have a significant effect on changes in a person's health condition.

According to the researcher's assumptions, the proper application of warm red ginger compresses can contribute to significant physiological changes, such as pain reduction or improvement of certain conditions. Furthermore, these results also indicate that the appropriate use of alternative methods can help improve the quality of life of individuals experiencing specific health problems.

B. Normality Test

Based on the results of the histogram analysis, the data distribution does not appear to form a symmetrical bell shape, which is a typical characteristic of normally distributed data. Therefore, it can be concluded that the data in this study are not normally distributed. Furthermore, the skewness ratio calculation shows that the skewness values for the pre-test and post-test are 1.196 and 0.485, respectively, indicating that the data distribution is not completely symmetrical. Likewise, the kurtosis ratio calculation produced values of −1.111 for the pre-test and −1.483 for the post-test, indicating that the data distribution is not perfectly normal, with a tendency to be either more peaked or flatter than the ideal normal distribution.

The results of the Kolmogorov–Smirnov test further strengthen these findings, where the p-value for the pre-test is 0.000 < 0.05, and the p-value for the post-test is also 0.000 < 0.05. Since the p-values are smaller than 0.05, it can be concluded that the data in this study are not normally distributed. Thus, based on the results of these four normality testing methods, the analysis in this study was carried out using the non-parametric Wilcoxon Signed Rank test, which is more appropriate for data that do not meet the assumption of normal distribution. The use of this method allows the analysis to remain valid and provide accurate results even though the data do not follow a normal distribution pattern.

C. Bivariate Analysis

Based on the results of the study, the Wilcoxon Signed Rank test obtained a Z value of -9.204 with a significance value (Asymp. Sig. 2-tailed) of 0.000. The negative Z value indicates

a decrease in pain scores after the administration of warm red ginger compresses, which suggests that this intervention has a significant effect in reducing the level of dysmenorrhea pain among the study respondents. The p-value of 0.000 < 0.05 confirms that the difference in pain levels before and after the intervention is statistically significant, indicating that warm red ginger compresses are effective in reducing dysmenorrhea pain in the students who participated in this study.

In this study, a p-value that is much smaller than 0.05 indicates that the difference in pain levels before and after the warm red ginger compress is highly significant, and statistically it can be proven that the changes that occurred were caused by the effect of the warm red ginger compress. In other words, these results confirm that the warm red ginger compress method is effective in reducing dysmenorrhea pain among nursing students who participated as respondents in this study.

These results are in line with the study conducted by (Kasi et al.,2023), who examined the effect of warm red ginger compresses on reducing menstrual pain among nursing students. The study used a pre-experimental one-group pretest–posttest design, in which the statistical test results showed a p-value of 0.000, which was smaller than $\alpha = 0.05$. Therefore, it can be concluded that warm red ginger compresses have a significant effect on reducing menstrual pain.

In addition, the study by (Fatmawati dan Muliawati,2023), which examined the effectiveness of a ginger–lemongrass–date decoction in reducing the degree of dysmenorrhea pain, also found that warm red ginger compresses can significantly reduce pain levels in women experiencing dysmenorrhea. The Wilcoxon test results in this study showed a p-value of 0.000, indicating a significant difference before and after the administration of the warm red ginger compress.

Red ginger (*Zingiber officinale* var. *rubrum*) has long been recognized as an herbal plant with various health benefits, particularly in alleviating menstrual pain or dysmenorrhea. One method of utilization is through a warm red ginger compress, which can significantly help reduce the intensity of pain. The heat from the compress works by increasing blood circulation to the abdominal area, helping to relax the uterine muscles and reduce excessive uterine contractions, which are the main causes of menstrual pain (Siagian & Ritonga, 2021).

According to the researchers' assumptions, the warm red ginger compress works through two main mechanisms: the thermal effect of the compress, which increases blood flow and relaxes the uterine muscles, and the pharmacological effect of the active compounds in red ginger, such as gingerol and shogaol, which have anti-inflammatory and analgesic properties. The combination of these two effects contributes to a significant reduction in menstrual pain among the respondents.

The application of non-pharmacological therapy, such as warm red ginger compresses, is also safer compared to the use of analgesic drugs like NSAIDs (ibuprofen or mefenamic acid), which, although effective, may cause side effects such as gastric irritation and kidney disorders if used long-term. Therefore, the warm red ginger compress method can be considered a more natural, low-risk, and easily applicable alternative for women experiencing dysmenorrhea.

CONCLUSION

1. The characteristics of the respondents in this study showed that the majority of female students experiencing dysmenorrhea were aged 18–25 years (90.1%), while the remaining 9.9% were aged 14–17 years. In addition, the distribution of respondents according to the day of menstruation indicated that most experienced menstruation on the 2nd day (41.8%),

followed by the 3rd day (30.5%) and the 1st day (27.7%). This suggests that the majority of respondents experienced peak menstrual pain during the first to third days of their cycle.

2. The mean pain scale before (pre-test) and after (post-test) applying the warm red ginger compress showed a significant decrease. The mean pre-test pain scale score was 4.84 with a standard deviation of 1.510, while the post-test score decreased to 3.19 with a standard deviation of 1.314. These results indicate that the warm red ginger compress is effective in reducing dysmenorrhea pain among the respondents.
3. The Wilcoxon Signed-Rank test showed a significant difference between pain scores before and after the warm red ginger compress, with a Z value of −9.204 and a p-value of 0.000 ($p < 0.05$). These values confirm that the reduction in pain scale scores was not due to chance, but was the result of the actual effect of the warm red ginger compress.

REFERENCES

1. E. Fatmawati and D. Muliawati, "Efektivitas Rebusan Jahe Sereh Kurma Dalam Menurunkan Derajat Nyeri Dismenore," *Jurnal Kesehatan Madani Medika*, vol. 14, no. 2, pp. 230–235, 2023.
2. B. Karlinda, O. Hasanah, and E. [Erwin], "Gambaran Intensitas Nyeri, Dampak Aktivitas Belajar, Dan Koping Remaja Yang Mengalami Dismenore," *Jurnal Vokasi Keperawatan (Jvk)*, vol. 5, no. 2, pp. 128–137, 2022, doi: 10.33369/jvk.v5i2.23310.
3. K. Z. Kasi, Agustin, and N. Fitri, "Pengaruh Kompres Hangat Jahe Merah Terhadap Penurunan Nyeri Menstruasi (Dismenorhea) Pada Mahasiswa Keprawatan," *Jurnal Penelitian Perawat Profesional*, vol. 6, no. 1, pp. 377–382, 2023.
4. H. Khotimah and S. S. Lintang, "Terapi Non-Farmakologi Untuk Mengatasi Nyeri Dismenore Pada Remaja," *Faletehan Health Journal*, vol. 9, no. 3, pp. 343–352, 2022.
5. T. A. Kusuma, A. Hikmanti, and L. Yanti, "Penerapan Senam Dismenore Untuk Meringankan Nyeri Dismenore," *Jurnal Kreativitas Pengabdian Kepada Masyarakat (PKM)*, vol. 6, no. 9, pp. 3896–3909, 2023, doi: 10.33024/jkpm.v6i9.11447.
6. Maulida, M. Saputra, and R. Ayuni, "Pengaruh Pemberian Jahe Merah Terhadap Penurunan Nyeri Dismenore Pada Remaja," *Jurnal Asuhan Ibu Dan Anak*, vol. 8, no. 2, pp. 73–80, 2023.
7. H. Al Mutair and S. Jahan, "Knowledge And Practice Of Self-Hygiene During Menstruation Among Female Adolescent Students In Buraidah City," *Journal of Family Medicine and Primary Care*, vol. 6, no. 2, pp. 169–170, 2022, doi: 10.4103/jfmpc.jfmpc.
8. C. Nugraheni, D. Puspitasari, and E. D. Prajayanti, "Penerapan Kompres Hangat Terhadap Skala Nyeri Dismenore Pada Remaja Putri Di Desa Tanjung Sukoharjo," 2024, vol. 4.
9. K. Sari, A. Agustina, G. Nivi, and S. Wonggo, "Literatur Review Penatalaksanaan Non-Farmakologis Dismenore Pada Remaja Putri," *Prosiding Seminar Nasional Dan CFP Kebidanan Universitas Ngudi Waluyo*, vol. 2, no. 2, pp. 1114–1128, 2023.
10. H. S. Siagian and M. Ritonga, "Pengaruh Minuman Jahe Merah (Zingiber Offcinale Roscoe Var. Rubrum) Terhadap Penurunan Skala Nyeri Dismenorea Primer Pada Mahasiswi Di Program Studi S1 Farmasi Universitas Imelda Medan," *JIFI (Jurnal Ilmiah Farmasi Imelda)*, vol. 5, no. 1, pp. 11–15, 2021, doi: 10.52943/jifarmasi.v5i1.622.
11. Sumiaty, Sakti, Putri Mulia, and Hasnawati, *Atasi Dismenorea Pada Remaja Dengan Terapi Komplementer*, Penerbit P4i, 2022.
12. S. Susilawati, R. Wulandari, and A. S. Rini, "Efektivitas Air Kelapa Hijau Dan Kompres Air Hangat Untuk Mengurangi Dismenore Primer Pada Remaja Putri Di PMB S Tahun 2023," vol. 5, no. 2, pp. 5751–5759, 2024.

13. R. O. Umboro, F. Apriliany, and R. P. Yunika, "Konseling, Informasi, Dan Edukasi Penggunaan Obat Antinyeri Pada Manajemen Penanganan Nyeri Dismenore Remaja," *Jurnal Abdidas*, vol. 3, no. 1, pp. 23–33, 2022, doi: 10.31004/abdidas.v3i1.525.
14. R. Wirenviona and A. A. I. D. C. Riris, *Edukasi Kesehatan Reproduksi Remaja*, Airlangga University Press, 2020.