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Differences In Primary Menstrual Pain Intensity Before And After Applying Warm Red Ginger Compresses In Adolescent Girls

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ABSTRACT

Background: One of the problems experienced by adolescents, especially adolescent girls, is menstrual pain. Menstrual pain management could be carried out using non-pharmacological methods, one of which is a warm ginger compress. The most effective type of ginger in reducing pain intensity was red ginger. The purpose of this study was to determine the difference in primary menstrual pain intensity before and after administering a warm red ginger compress to adolescent girls. Method: The research method used was pre-experimental with a one-group pretest-posttest design. The sample consisted of 20 female students of grade 10 students selected by accidental sampling who experienced primary menstrual pain. Assessment of pain intensity was carried out using a numeric rating scale (NRS). The research subjects were given a warm red ginger compress once with a duration of 15 minutes on the lower abdomen. Bivariate analysis used Wilcoxon test with $\alpha < 0.05$. Result: The results showed that the median score of menstrual pain intensity before administering the warm red ginger compress was 5, and after administering the warm red ginger compress, the median decreased to 2 with a ρ value of $0.00 < \alpha$ (0.05) and a Z value of -3.970. Conclusion: The conclusion was that there was a significant difference in the intensity of primary menstrual pain in adolescent girls before and after administering the warm red ginger compress. Warm red ginger compresses were recommended for adolescent girls as a non-pharmacological alternative to reduce the intensity of primary menstrual pain.

Keywords: adolescent girls; menstrual pain; warm compress; red ginger

Introduction

Adolescence is an important stage in an individual's life that marks the transition from childhood to adulthood. During this phase,significant developments have occurred,included in the contextreproductive function that affects various aspects of life such as social interaction, mental health, and physical condition. One of the common challenges experienced by adolescents, especially adolescent girls, is menstrual pain or dysmenorrhea which can affect their overall health (Widyanthi et al., 2021).

The incidence of dysmenorrhea worldwide varies between 45% and 95%, where 2% to 29% experience severe menstrual pain. The incidence of dysmenorrhea is greater in women under 24 years of age where the prevalence is 70% to 90% (Itani et al., 2022) . According to the World Health Organization (WHO) in 2020, around 90% of women experience dysmenorrhea, of which 10% to 16% experience severe menstrual pain. The incidence of dysmenorrhea in Indonesia is 64.25%, divided into 54.89% experiencing primary dysmenorrhea and 9.36% experiencing secondary dysmenorrhea. There has been no official report on the incidence of dysmenorrhea in Bali, but several studies have shown that the incidence of dysmenorrhea in Bali is high (Artawan et al., 2022) . Based on research Silaen et al (2019) stated that the incidence rate of dysmenorrhea in Bali was 74.42%.

Dysmenorrhea is one of the main factors that disrupts the educational participation of adolescent girls and their activities. According toSachedina and Todd (2020)This condition can significantly affect their quality of life, increasing the risk of anxiety and depression. The results of the study by Fahmiah et al. (2022) showed that almost half, namely 43.33% of female adolescents at SMK Al-Hidayah Kepulauan Arjasa decided to go home when experiencing dysmenorrhea and most of the other female students experienced a decrease in learning concentration of 53.33%, chose to stay in class by 63.33%, and felt weak when experiencing dysmenorrhea by 60%.

Dysmenorrhea treatment can be done with pharmacological and non-pharmacological methods. One of the commonly used pharmacological methods is non-steroidal anti-inflammatory drugs (NSAIDs), but giving menstrual pain treatment using pharmacological methods can only be given according to indications, because each drug can cause side effects (Haqqattiba et al., 2020) . Common side effects of NSAIDs to reduce menstrual pain are gastric ulcers or septic ulcers and can be accompanied by secondary anemia due to bleeding, platelet dysfunction, and gastrointestinal problems (Magdalena et al., 2019). Pharmacological methods often cause side effects which encourage the need for alternative therapies that are safer for the body (Khotimah and Lintang, 2022). One solution is a non-pharmacological method, such as using warm compresses, cold compresses, and abdominal stretching (Hartinah et al., 2023). Research by Anggriani et al. (2021) shows that warm compresses are the main choice for dealing with menstrual pain because they do not cause side effects and are easy to do, compared to pharmacological therapy which has risks (Misliani et al., 2019).

The warm compress method utilizes warm temperatures to create physiological effects and physical changes that can increase muscle relaxation, increase blood flow, improve cell metabolism, reduce anxiety, reduce pain, and increase comfort. The addition of natural ingredients, one of which is ginger, can increase the benefits of warm compresses. Ginger has physiological effects such as heat, antitumor, antimicrobial, antioxidant, antiobesity, and anti-inflammatory. The types of ginger that are often found in Indonesia are types of emprit ginger, elephant ginger, and red ginger (Rahayu et al., 2017).

Red ginger (Zingiber Officinale Var. Rubrum) is the type of ginger that is most effective in reducing pain intensity (Rahayu et al., 2017) . Red ginger is said to be the most effective in reducing pain intensity because red ginger has the highest oleoresin content compared to other types of ginger. The oleoresin content in ginger contains cyclooxygenase which can inhibit the formation of prostaglandin levels as anti-inflammatory and antioxidant mediators, thus helping muscles to relax so that inflammation and pain decrease (Sukini et al., 2023).

Research conductedKaromika et al (2019) showed that warm ginger compresses were better at reducing menstrual pain than just using warm compresses. The results of other studies conducted Napu et al (2023) stated that ginger water compresses can significantly reduce dysmenorrhea in adolescent girls. Based on research conducted Goddess (2021) stated that there was no significant difference in the scale of dysmenorrhea pain between respondents who were given warm water compresses and respondents who were given warm red ginger compresses (p value = 0.578). The difference between this study and previous studies is the location of the study, the number and sampling, and the difference in the procedure for warm red ginger compresses in reducing the intensity of menstrual pain in adolescent girls.

The results of a preliminary study conducted on November 25, 2023 at Kuta 1 State Senior High School, based on interviews with 11 female students, found that 10 female students experienced dysmenorrhea, with 6 of them saying that the dysmenorrhea they felt interfered with their activities. Efforts made by the school in overcoming menstrual pain are only using pharmacological methods by administering painkillers and eucalyptus oil. The absence of non-pharmacological treatment as an alternative in reducing the intensity of menstrual pain in female adolescents at State Senior High School 1 Kuta, so researchers are interested in conducting a study on the difference in the intensity of primary menstrual pain before and after administering warm red ginger compresses.With this research, it is hoped that students and schools can overcome primary menstrual pain by utilizing non-pharmacological therapy using warm red ginger compresses.

Research Method

A. Design

The design of this research is pre-experimental with one group pretest-posttest design where this research uses a causal relationship by looking at one group of subjects.

B. Context

The study was conducted at State Senior High School 1 Kuta located at Jalan Dewi Saraswati, Seminyak, Kuta, Badung. The researcher chose this location because after conducting a preliminary study on 11 female students, it was found that 10 female students experienced dysmenorrhea. Another reason the researcher chose State Senior High School 1 Kuta was because previously there had been no research on the management of menstrual pain with non-pharmacological methods at the school. This research and data collection was conducted for 3 months from 15 March 2024 to 15 May 2024.

C. Population and Sample

1. Population

The target population in this study was 207 female students of class X of SMA Negeri 1 Kuta. The researcher selected respondents with the following inclusion and exclusion criteria:

a) Inclusion criteria:

1) A grade X student who is willing to be a respondent
2) Students who do not have a history of disease or reproductive problems
3) Students who experience abdominal pain due to menstruation, menstrual pain is felt on the first day of menstrual pain from day 1 to day 3 of menstruation
4) Students who do not have a history of allergies to red ginger.

b) Exclusion criteria:

1) Students who have a history of disorders in the reproductive system
2) Students who experience abdominal pain due to congenital abnormalities, disease, and trauma
3) A female student who consumes menstrual pain relief medication.

2. Sample

Sampling in this study used Non-probability sampling with Accidental sampling technique. The sample in this study was 20 respondents, female students of class X of SMA Negeri 1 Kuta who experienced abdominal pain due to menstruation on the first day to the third day who met the inclusion and exclusion criteria who were willing to be involved in this study.

D. Data Collection

1. Types of data collected

The data collected in this study were primary data. Primary data is data that comes directly from the subject of observation/measurement or comes from the first source (Heryana, 2020). The type of primary data collected in this study used the Numeric Ratting Scale (NRS) method in assessing pain intensity semi-quantitatively, by allowing respondents to choose a number from 0 to 10 to describe the pain before the intervention was given and re-select a number from 0 to 10 to describe the pain felt after the intervention was given.

2. Data collection technique

The steps that the researcher took in the process of collecting research data included requesting permission from various related parties including the head of the midwifery department, the ethics commission of the Denpasar polytechnic, the investment office and the one-stop integrated service office of the Badung district government, and the head master of senior high school 1 Kuta. The researcher also coordinated with the two enumerator at the senior high school 1 kutal to equalise perceptions regarding the research flow and respondent criteria and provide a google form to capture respondents. After obtaining respondents who fit the criteria, the intervention was carried out in the UKS of Senior High School 1 Kuta. The collected data were then processed and analysed using a computer program and continued with the preparation of the final research report.

E. Data Analysis

The data analysis techniques used in this study are univariate and bivariate analysis which aim to describe or explain the characteristics of each variable in this study.

1. Univariate analysis

In this study, the analysis was conducted by determining the frequency distribution based on age, the first day of menstrual pain, age of menarche, duration of menarche, and history of dysmenorrhea of the respondents as well as an analysis of the picture of the intensity of primary menstrual pain before and after giving warm red ginger compresses which were presented in the form of median, minimum, and maximum values because the data were not normally distributed.

2. Data normality test

The data normality test used is the Shapiro Wilk test. The Shapiro Wilk test is used because in this study the number of samples is less than 50 respondents. The results of the data normality test obtained data that were not normally distributed with $\rho < 0.05$.

3. Bivariate analysis

This study conducted a bivariate analysis to test or prove the hypothesis that has been set by the researcher, namely the effect of warm red ginger compresses after giving warm red ginger compresses to female adolescents at State Senior High School 1 Kuta. To find out the results of the hypothesis, several analyses are needed.

F. Research Ethics

The general ethical principles of health research that have been recognized and agreed upon include 3 principles, where these principles have moral power so that a research

can be accounted for. The three ethical principles include:

1. The principle of respect for human dignity (respect for persons)

In this study, respondents obtained complete information about the freedom and right to refuse or participate as respondents and respondents were given complete information about the purpose of the study. If respondents are willing or agree to be prospective respondents, they are required to fill in the informed consent and if prospective respondents are not willing or do not agree, data collection is not carried out.

2. The principle of doing good (beneficence) and not doing harm (non-maleficence)

In this study, young women who are willing and selected to be respondents can help achieve the research objectives and researchers have considered the risks that respondents will receive as research subjects.

3. The principle of justice

In this study, researchers provide the same treatment without discriminating between each respondent.

Results and Discussions

Results

A. Characteristics of research subjects

The research subjects in this study were 20 female adolescents who experienced primary menstrual pain at State Senior High School 1 Kuta who met the inclusion and exclusion criteria.

Table 1
Characteristics Subjects in Adolescent Girls at State Senior High School 1 Kuta in 2024

	Characteristics	Frequency (f)	Percentage (%)
Age	15 years	11	55
	16 years	9	45
Total		20	100
Menstruation Day	First day	12	60
	The second day	8	40
Total		20	100
Age of Menarche	≤ 12 Years	12	60
	>12 Years	8	40
Total		20	100
Duration of Menarche	≤ 3 Years	18	90
	>3 Years	2	10
Total		20	100
History of Dysmenorrhea	Yes	12	60
	No	8	40
Total		20	100

Table 1 shows the characteristics of the research subjects at Senior High School 1 Kuta in 2024. Based on the table above, most of the research subjects were 15 years old (55%), most of the research subjects experienced menstrual pain on the first day (60%), most of the research subjects had a history of menarche ≤ 3 years (90%), most of the menarche age of the research subjects was ≤12 years (60%) and most of the research subjects had a history of dysmenorrhea (60%).

B. Intensity of primary menstrual pain before giving warm red ginger compress

The results of observations on the intensity of primary menstrual pain felt by 20 female adolescent respondents before being given warm red ginger compresses are presented in Table 2.

Table 2
Primary Menstrual Pain Intensity Before Intervention at State Senior High School 1 Kuta in 2024

Pain Level	Frequency (f)	Percentage (%)	Median	Minimum	Maximum
4	8	40			
5	7	35	5	4	6
6	5	25			
Total	20	100			

Presentation of data in table 2, it can be seen that before the intervention (red ginger warm compress) the intensity of primary menstrual pain in adolescent girls. The intensity of pain was felt with the lowest level of pain with a score of 4 as many as 8 people with a percentage of 40%, the highest score of 6 as

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many as 5 people with a percentage of 25%, and a median of 5 as many as 7 people with a percentage of 35%. It can be concluded that before the intervention, the highest pain intensity score of respondents was with a score of 4 as many as 8 people.

C. Intensity of primary menstrual pain after giving warm red ginger compress

The results of observations on the intensity of primary menstrual pain felt by 20 female adolescent respondents after being given a warm red ginger compress are presented in Table 3.

Table 3
Primary Menstrual Pain Intensity After Intervention at State Senior High School 1 Kuta in 2024

Pain Level	Frequency (f)	Percentage (%)	Median	Minimum	Maximum
1	3	15			
2	9	45	2	1	3
3	8	40			
Total	20	100			

Presentation of data in table 3, it can be seen that after the intervention (warm compress of red ginger) the intensity of primary menstrual pain in adolescent girls. The intensity of pain was felt with the lowest level of pain with a score of 1 as many as 3 people with a percentage of 15%, the highest score of 3 as many as 8 people with a percentage of 40%, and a median of 2 as many as 9 people with a percentage of 45%. It can be concluded that after the intervention, the highest pain intensity score of respondents was with a score of 2 as many as 9 people.

D. Differences in the intensity of menstrual pain in adolescent girls before and after giving warm red ginger compresses

The results of the analysis using the Wilcoxon test, the intensity of primary menstrual pain felt by 20 female adolescent respondents before and after giving warm red ginger compresses are presented in Table 4.

Table 4
Differences in Intensity of Menstrual Pain in Adolescent Girls Before and After Giving Warm Compress of Red Ginger at State Senior High School 1 Kuta in 2024

Primary Menstrual Pain Intensity		N	Mean Rank	Sum of Ranks	Z value	p *value*
Posttest-Pretest	Negative Ranks	20	10,50	210,00	-3,970	0,000
	Positive Ranks	0[b]	0,00	0,00		
	Ties	0[c]				
	Total	20				

Table 4 explains that all respondents, 20 female adolescents, experienced a decrease in the intensity of menstrual pain after being given a warm compress of red ginger. The mean rank value or average ranking is 10.50 and the sum of rank value or the number of ranks against the increase is 210.00. The results of the bivariate analysis with the Wilcoxon test obtained a Z value of -3.970 with a ρ value = 0.00 (α <0.05). This shows that there is a significant difference in the intensity of primary menstrual pain in female adolescents before and after being given a warm compress of red ginger, thus warm compresses of red ginger are useful in reducing the intensity of primary menstrual pain in female adolescents.

Discussion

A. Intensity of primary menstrual pain in adolescent girls before giving warm red ginger compresses

The results of the study that has been conducted on the intensity of menstrual pain felt by adolescent girls before giving warm compresses of red ginger are presented in table 2 and it was found that the minimum menstrual pain intensity score of adolescent girls was 4 for 8 people (40%), the maximum score was 6 for 5 people (25%), and the median score was 5 for 7 people (35%). The category of pain felt by all respondents in this study can be categorized as moderate pain.

Another study conducted by Kasi et al (2024) stated that before giving warm red ginger compresses, the intensity of menstrual pain was categorized as moderate pain with a score of 5 with a total of 10 respondents (43.5%), a score of 4 with a total of 6 respondents (26.1%), and a score of 6 with a

total of 5 respondents (21.7%), a small number of respondents were categorized as mild pain with a total of 2 respondents (8.7%) and none of the respondents were categorized as no pain and severe pain. In the study by Harmawati et al (2018) it can be seen that out of 10 respondents the lowest pain score was 4 and the highest score was 6, the pain score felt by respondents in this study before giving warm red ginger compresses could be categorized as moderate pain.

Based on this study and previous studies, researchers can conclude that before giving warm red ginger compresses, most respondents experienced moderate pain levels that could interfere with their daily activities. According to Horman et al (2021), there are several factors that can influence primary dysmenorrhea, including age of menarche, duration of menstruation longer than normal (7 days), family history, and exercise habits. Based on table 1, most of the respondents age is 15 years (55%), some respondents experience menstrual pain on the first day of menstruation (60%), some respondents have a history of menarche ≤ 3 years (90%), some respondents experience menarche at the age of ≤ 12 years (60%) and some respondents have a history of dysmenorrhea (60%).

B. Intensity of primary menstrual pain in adolescent girls after giving warm red ginger compresses

The results of the study showed that after giving warm compresses of red ginger to young women as presented in table 3, the minimum score of menstrual pain intensity felt by young women was 1 for 3 people (15%), the maximum score was 3 for 8 people (40%), and the median score was 2 for 9 people (45%). Based on the data obtained, there was a decrease in the score of menstrual pain intensity after being given warm compresses of red ginger.

The results of the study showed that after giving warm red ginger compresses, all respondents experienced mild pain levels. In accordance with research by Kasi et al (2024) and Harmawati et al (2018) which stated that after being given a warm red ginger compress intervention, all respondents experienced a decrease in pain levels. It can be concluded that giving warm red ginger compresses can be an alternative to overcome menstrual pain in adolescent girls and can support the diversity of non-pharmacological pain treatments.

C. The effect of giving warm compresses with red ginger on primary menstrual pain in adolescent girls

Ginger compress is a non-pharmacological method using a mixture of warm water and grated ginger that can cause a spicy and warm effect. The most effective type of ginger in reducing pain intensity is red ginger (Zingiber Officinale Var. Rubrum) because it has the highest oleoresin content compared to other types of ginger. The oleoresin content in ginger contains cyclooxygenase which can inhibit the formation of prostaglandin levels as anti-inflammatory or pain mediators and antioxidants, thus helping muscles to relax and pain inflammation decreases so that the body becomes relaxed.

The results of the normality test using the Shapiro Wilk test showed that in this study the data was not normally distributed, so further analysis used the Wilcoxon test. The results of the data analysis on the difference in the intensity of menstrual pain in adolescent girls before and after giving warm compresses with red ginger showed that warm compresses with red ginger could reduce the intensity of menstrual pain with a p value = 0.00 (α <0.05). The mean rank value or average rank is 10.50 and the sum of rank value or the number of ranks against the increase is 210.00. This shows that there is a significant difference in the intensity of primary menstrual pain in adolescent girls before and after giving warm compresses with red ginger, thus warm compresses with red ginger are useful in reducing the intensity of primary menstrual pain in adolescent girls.

Researchers can conclude that warm compresses of red ginger can be used as a non-pharmacological method to overcome primary menstrual pain, especially for adolescent girls with pain intensity scores of 1 to 6. Red ginger can also be used as another alternative medicine in reducing the intensity of pain from various other diseases because the content of red ginger can inhibit the formation of prostaglandin levels as anti-inflammatory or pain mediators and antioxidants, thus helping muscles to relax and inflammation of pain decreases so that the body becomes relaxed.

Conclusion

Based on the research results, it can be concluded that there is a significant difference in the intensity of primary menstrual pain in adolescent girls before and after being given a warm red ginger compress especially for adolescent girls with pain intensity scores of 1 to 6. Red ginger can also be used as another alternative medicine in reducing the intensity of pain from various other diseases because the content of red ginger can inhibit the formation of prostaglandin levels as anti-inflammatory or pain mediators and antioxidants, thus helping muscles to relax and inflammation of pain decreases so that the body becomes relaxed.

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