THE EFFECT OF WILLIAM FLEXION EXERCISE TECHNIQUE ON MENSTRUAL PAIN SCALE (DYSMENORRHEA) IN FEMALE STUDENTS OF SMA NEGERI 2 PEKANBARU

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Abstract

Primary dysmenorrhea is menstrual pain caused by increased prostaglandin production, leading to uterine contractions in adolescents. One non-pharmacological method that can be used to reduce menstrual pain is the William Flexion Exercise, a physical exercise designed to strengthen the pelvic and lower abdominal muscles, thereby helping to alleviate pain. This study aims to determine the effect of the William Flexion Exercise on the primary dysmenorrhea pain scale in female students of SMA Negeri 2 Pekanbaru. This research employs a quantitative approach with a quasi-experimental design using a pre-test and post-test method. The study sample consists of 33 respondents experiencing primary dysmenorrhea, selected based on inclusion criteria, namely those experiencing menstrual pain on the first day. The study was conducted on Monday, February 10, 2025, from 09:00 to 12:30 WIB. The research instruments used include the Numeric Rating Scale (NRS) and Standard Operating Procedures (SOP). Data analysis was performed using the Paired T-Test. The results showed that before the intervention, the average menstrual pain scale among respondents was 5.70, while after performing the William Flexion Exercise, the average pain scale decreased to 3.82. The Paired T-Test analysis resulted in a p-value of 0.000

Keywords: william flexion exercise, primary dysmenorrhea, adolescents.

INTRODUCTION

The WHO defines adolescents as people aged 10-19 years, while the Indonesian Minister of Health Regulation Number 25 of 2014 defines them as people aged 10-18 years. The National Population and Family Planning Agency (BKKBN) has its own definition of adolescents. According to the BKKBN, adolescents are defined as people aged 10-24 years who are unmarried (Bancin et al., 2022).

According to Mappiare, adolescence lasts between the ages of 12 and 21 for women and 13 and 22 for men. Adolescence also marks the transition from childhood to adulthood, beginning with sexual maturity. During adolescence, individuals experience menstruation. Menstruation is the shedding of the endometrium, the lining of the uterus, which contains numerous blood vessels. Various problems can occur during the menstrual cycle, one of which is menstrual pain (dysmenorrhea). Menstruation in adolescents can cause problems if not managed properly. For some adolescent girls, primary dysmenorrhea is a monthly ordeal, requiring them to find appropriate solutions. There are many ways to eliminate or reduce dysmenorrhea (Rachmawati et al., 2020).

Dysmenorrhea is menstrual pain caused by excessive prostaglandin release. This increases uterine contractions, leading to pain during menstruation. Factors associated with dysmenorrhea include the duration of menstruation, stress levels, and menarche (Aulia & Herida Pinem, 2023). There are two types of dysmenorrhea: primary and secondary, classified based on the underlying cause of menstrual pain. Primary dysmenorrhea is menstrual pain that

is not caused by a gynecological disorder (female reproductive organs) but is a normal part of menstruation itself. Secondary dysmenorrhea is menstrual pain that is generally associated with some type of gynecological disorder. Most of these disorders can be easily treated with menstrual pain medication or even surgery. Secondary dysmenorrhea is more likely to be experienced by women during adulthood (Ayu Setiawan & Lestari, 2020).

The incidence of dysmenorrhea varies from country to country. According to the World Health Organization (WHO), the global incidence is over 50%. In the United States, it is around 85%, in Italy around 84.1%, and in Sweden around 72%. In Indonesia, the prevalence of menstruation is 64.25%, with 54.89% experiencing their first period and 9.36% experiencing their second (Oktri Sani & Nur Isnaeni, 2024). Dysmenorrhea can be treated pharmacologically with analgesics, painkillers, and non-steroidal anti-inflammatory drugs, such as mefenamic acid, ibuprofen, piroxicam, and others. Non-pharmacological methods such as light exercise, relaxation techniques, and warm compresses can also be used.

A light exercise that can be used is the William flexion exercise. The William flexion exercise was developed by Dr. Paul William in 1937 to reduce lower back pain. This exercise involves strengthening the abdominal and gluteus maximus muscles and stretching the back extensor muscles. The main movement is lumosacral flexion, with the caveat that the exercise should be performed daily without exceeding a tolerable level of pain (Wulandari et al., 2024). Some William flexion exercise movements aim to strengthen the abdominal muscles and mobilize the lower lumbar region. Contraction of the abdominal and lower lumbar muscles will put pressure on the large blood vessels in the abdomen which will then increase the volume of blood flowing throughout the body including the reproductive organs. This can facilitate the supply of oxygen to blood vessels experiencing vasoconstriction, so that menstrual pain can be reduced (Masripah et al., 2024). Research conducted by Astuti (2019) regarding the effect of William flexion exercise on dysmenorrhea pain, found that the results of the analysis using the paired TTest test with a significance level of 5% showed a calculated t of 13.581, exceeding the t table value of 2.093 (calculated t > t table). The significance value of P obtained was 0.000, lower than the significance level of 0.05. Therefore, it can be concluded that H0 is rejected and Ha is accepted, indicating a significant effect of administering William flexion exercise therapy on dysmenorrhea pain (Wulandari et al., 2024).

RESEARCH METHODS

This study used a quantitative method with a quasi-experimental design, which aims to determine the effect of an intervention without an intervention group. The approach used was a one-group pre-test post-test design, where the menstrual pain (dysmenorrhea) scale was measured before and after the William Flexion Exercise technique intervention was given. This method allowed researchers to assess the effectiveness of the exercise in reducing menstrual pain levels in female students at SMA Negeri 2 Pekanbaru. The sample size in this study was 33 female students experiencing primary menstrual pain (dysmenorrhea). Sample selection was based on inclusion criteria, namely female students who were experiencing menstrual pain on the first day and were not taking painkillers during the study. The sample was selected using a purposive sampling technique, which is a technique for selecting respondents based on certain criteria relevant to the research objectives. This technique was used to obtain more specific data and in accordance with the research needs. This study was conducted at SMA Negeri 2 Pekanbaru in January 2025. This location was selected based on the large number of female students and the significant number of cases of primary dysmenorrhea at the school. Based on a preliminary study conducted previously, it was found that most female students experience

menstrual pain of varying severity, so this study was deemed relevant to be conducted at the school. The research instrument used in data collection was a questionnaire consisting of two main parts. The first part contained the respondents' identities, including name, age, and duration of menstruation. The second part was a Numeric Rating Scale (NRS) used to assess the level of menstrual pain before and after the intervention. The NRS scale has a value range of 0 to 10, where 0 means no pain, 1-3 mild pain, 4-6 moderate pain, and 7-10 severe to very severe pain. Respondents were asked to fill out the pain scale in the pre- test, before being given the William Flexion Exercise, and the post-test, after the intervention was carried out.

RESEARCH RESULTS

A. Univariate Analysis

Analysis univariate is analysis Which used For get data regarding the characteristics of the respondents. The univariate results obtained in this study are:

1. Characteristics Respondents

Table 1. Characteristics Respondents Student SENIOR HIGH SCHOOL Country 2 Pekanbaru Based on Age

Variables	N	Mean	Min- Max
Age	33	17.55	17-18

(Source : Analysis Data Primary, 2025)

Based on Table 1, it can be seen that respondents experienced primary dysmenorrhea. This is evident from the respondent characteristics, where more than half of the respondents were 18 years old, namely 18 female students (17.55).

Table 2. Characteristics Respondents Student SENIOR HIGH SCHOOL Country 2 Pekanbaru Based on Long Period of Menstruation

Characteristics	**Frequency**	**Percentage (%)**
Long Experience Period		
a. 5 Days	15	45.5 %
b. 6 Days	9	27.3 %
c. 7 Days	9	27.3 %
Total	**33**	**100%**

(Source : Analysis Data Primary, 2025)

Table 2 shows that respondents experienced primary dysmenorrhea. This is evident from the respondent characteristics, where more than half (45.5%) experienced menstrual pain for 5 days.

2. Average Scale Painful Period Student in SENIOR HIGH SCHOOL Country 2 Pekanbaru

Table 3. Average Scale Painful Period Student in SENIOR HIGH SCHOOL Country 2 Pekanbaru

Variables	N	Mean	Min- Max	Elementary School
Pre-Test	33	5.70	3- 9	1,447
Post- Test	33	3.82	1- 7	1,590

(Source : Analysis Data Primary, 2025)

Table 4. Influence Technique *William Flexion Exercise* To Scale Painful Primary Menstruation (*Dysmenorrhea*) in Female Students of State Senior High School 2 Pekanbaru

Dysmenorrhea	Mean	Mean Difference	T Count	*P- Value*
Pre-Test				
Post- Test	5.70 3.82	- 1.88	13,162	0,000

(Source: Analysis Data Primary, 2025)

Based on table 4, 33 female students were given the William Flexion Exercise technique on the primary menstrual pain (dysmenorrhea) scale in high school female students, namely 33 female students obtained an average pre-test score or before being given the intervention of 5.70 and an average post-test score or after being given the intervention of 3.82.

A. Bivariate Analysis

To determine whether the data distribution is normal or not, an analysis can be carried out using Skewness and kurtosis test. Data is considered normally distributed if the results of the skewness and kurtosis statistical calculations divided by the standard error are in the range of -2 to 2. In addition, data normality can also be evaluated through a histogram, where a symmetrical distribution indicates normally distributed data. If the data is proven to be normally distributed based on the normality test, then the research can be analyzed using the *paired T-Test* .

a) See Curve Histogram

By looking at the histogram curve of *the pre-test* and *post-test* data, the curve is bell-shaped and symmetrical so that the data is declared to be normally distributed.

b) See Ratio Skewness

Based on the skewness ratio, namely the skewness value divided by the standard value error skewness obtained For scale painful period *pre-test* (0.108 ÷ 0.409 = 0.26), on *post-test* (0.119 ÷ 0.409 = 0.48). Thus, the skewness ratio is in the range of -2 to 2, so the data is declared normally distributed.

c) See Ratio Kurtosis

Based on the kurtosis ratio, namely the kurtosis value divided by the standard error of kurtosis, the result is obtained for compliance style life Healthy *pre-test* (0.077 ÷ 0.798 = 0.09), on *post-test* (- 0.305
÷ 0.798 = -0.38). Thus, the kurtosis ratio is known to be in the range of -2 to 2, thus indicating a normal distribution.

d) Test of Normality (Shapiro Wilk)

The results of the normality test showed analytically the Shapiro Wilk test, the *pre-test value* was 0.076. and *the post-test value* is 0.155, so it is concluded that the above data is normally distributed. Data is said to be normally distributed if the p-value = <0.05, if the data is not normally distributed, then a non-parametric statistical test is used, for example the *Wilcoxon Signed Test. Rank* Test is used to see the effect before and after intervention. In this study, the test used was the *Paired T-Test.*

From these results, researchers can use the *Paired T-Test* which states that the data is normally distributed.

Table 5. Influence Technique *William Flexion Exercise* To Scale Painful Primary Menstruation (*Dysmenorrhea*) in Female Students of State Senior High School 2 Pekanbaru

Dysmenorrhea	Mean	Mean Difference	T Count	*P- Value*
Pre-Test				
Post- Test	5.70 3.82	- 1.88	13,162	0,000

(Source: Analysis Data Primary, 2025)

The results of data analysis in table 5. using paired sample T-Test on female students of SMA Negeri 2 Pekanbaru found the mean value of the Pre-Test results before therapy was 5.70 while the Post-Test after therapy was 3.82, with the mean difference between before and after being given the William flexion exercise technique found a value of -1.88 and T count of 13.162. It is known that P-Value = 0.000 <0.05, this indicates that H0 is rejected, which means there is a difference in the pain scale in female students of SMA Negeri 2 Pekanbaru between before and after being given the William flexion exercise technique.

DISCUSSION

1. Univariate Analysis

a. Characteristics Respondents

a) Age

Based on the research results, it can be seen that almost half of the respondents were 18 years old, namely 18 (54.5%), while half of the respondents were 17 years old, namely 15 (45.5%). Data from other studies show that 91% of female adolescents at the senior high school (SMA) level is at on range age 17-18 years experiencing dysmenorrhea. This condition not only impacts physical health, but also affects various aspects of life, especially in matter

Academically. As many as 55% of them reported that the symptoms of dysmenorrhea caused decreased concentration in learning, difficulty following lessons, and even academic performance. Which decrease. Even 26 % of them experienced delays or missed classes because they were unable to attend school when symptoms appeared. Although dysmenorrhea is a natural condition commonly experienced by women every month and is not considered dangerous, this disorder is quite significant in affecting productivity and daily activities (Farasari et al., 2024).

The prevalence of menstrual pain during menstruation is known to be higher in young women, especially those aged 17 to 24. Research suggests this prevalence rate is estimated to be between 67% and 90%, making it a very common condition in this age group. For example, a study conducted in Australia of high school girls showed that as many as 93% of the girls reported experiencing pain or discomfort. during menstruation. These results indicate that the majority of adolescent girls experience significant physical challenges related to their menstrual cycle. The pain often presents as cramps in the lower abdomen, but may also be accompanied by additional symptoms such as headaches, nausea, weakness, or emotional disturbances. This condition not only impacts physical health but also can affect daily activities, such as the ability to concentrate at school, participate in sports activities, or socialize with peers (H. Kojo et al., 2021).

b) Long Period of Menstruation

Based on the research results, it was found that more than half of the respondents experienced menstrual bleeding lasting 5 days with a frequency of 15 (45.5%). This 5-day menstrual bleeding can affect daily activities, especially in the school environment, making it difficult to concentrate while studying. A 5-day menstrual period is still considered normal, although many adolescents often complain of menstrual pain during this period. Dysmenorrhea generally occurs due to increased uterine contractions that help shed the uterine lining. When contractions occur continuously, the production of prostaglandins, the chemical compounds that trigger these contractions, increases. This often causes intense pain, especially in the lower abdomen, and can even radiate to the back or thighs. Some adolescents experience significant discomfort, especially if bleeding tends to be heavier from day 1 to day 5, with a blood volume of around 10-80 cc. This not only increases severe pain but can also disrupt daily activities if not properly intervened (Kurnia Sugiharti & Sumarni, 2020).

b. Average Menstrual Pain in High School Students Before (pre-test) and After (post-test) the William Flexion Exercise Technique

Based on the results of the study, it shows that the intervention on the results of the menstrual pain scale in the intervention group, from the first to the final examination results experienced changes, the changes seen starting at the final examination of the implementation of the intervention providing the William Flexion Exercise technique. The results of this study also show a difference in the average difference in the average menstrual pain scale before and after the intervention group. This indicates that female students who experienced dysmenorrhea who were given the William Flexion Exercise technique intervention experienced a decrease in the intervention group.

A study conducted by Sinta Wulandari & Kamidah (2024) found that the average pre-test and post-test scores were 6.55 and 0.70, respectively. This average showed a decrease of 5.85. Furthermore, the minimum and maximum pre-test scores were higher than the post-test scores. The results of this study showed a p-value of 0.000, which is lower than $p < 0.05$. These results indicate that *the William Flexion Exercise program significantly* reduced menstrual pain intensity in female students at SMP Ngeri 5 Talang Kelapa.

Another parallel study conducted by Nora Anggreini et al., (2022) obtained data that the majority of female students who experienced mild dysmenorrhea after (*post-test*) were given the *William Flexion Exercise technique* , found a significant effect between menstrual pain before and after being given the therapy where p <*value* = 0.001 is smaller than the alpha value (p <0.050) which indicates a significant difference. It can be concluded that there is an effect of *the William Flexion Exercise technique* on the level of menstrual pain (*dysmenorrhea*).

The results of the intervention data analysis showed that the average *pre-test score* was 5.70 and *the post-test was 3.82 with a pre-test* standard deviation of 1.447 and *a post-test of* 1.590.

2. Bivariate Analysis a. The Effect of Menstrual Pain Scale Before and After the Administration of the William Flexion Exercise Technique

Based on the results of *the Paired Sample T-Test,* the intervention statistics obtained a *p value* = 0.000 which is smaller than *alpha* <0.05, H0 failed to be rejected. This means that there is an influence of *the William Flexion Exercise* technique *on pre-test* and *post- test* scores .

Research conducted by Purwandani & Anggraini, (2023) found that most female adolescents (75%) experienced moderate to severe menstrual pain before being given intervention, with an average pain intensity of 5.70. After being given the *William flexion exercise technique* , which was carried out for 7-10 minute in accordance with Based on the SOP, the average menstrual pain intensity decreased to 2.85, with the majority (75%) of respondents experiencing pain on a scale of 1-3. This indicates a decrease in menstrual pain intensity before and after the intervention. These results are supported by statistical analysis, which showed a *p -value* of 0.000 <0.05, indicating that this technique had a significant effect in reducing menstrual pain intensity in adolescent girls at SMP Negeri 1 Sobang Pandeglang in 2022.

Conducted on the effect of the William Flexion Exercise technique on the scale of primary menstrual pain (dysmenorrhea) in female students at State Senior High School 2 Pekanbaru, the following conclusions can be drawn:

1. Respondent characteristics based on age were found to be more than half of the respondents aged 18 years (17.55) and based on the duration of menstrual pain, more than half of the respondents experienced menstruation for 5 days (5.82). 2. There is an average of primary menstrual pain (dysmenorrhea) in female high school students.
2. Pekanbaru before (Pre-Test) giving the William Flexion Exercise technique, namely with an average value of 5.70.
3. There was an average primary menstrual pain (dysmenorrhea) in female students of State Senior High School 2 Pekanbaru after (Post-Test) administration of the William Flexion Exercise technique, namely with an average value of 3.82.
4. There is a difference in the average primary menstrual pain (dysmenorrhea) in female students of SMA Negeri 2 Pekanbaru before and after being given the William Flexion Exercise technique with an average value of 1.879 with a p value of 0.000 so that the William Flexion Exercise technique has an effect on menstrual pain.

CONCLUSION

1. For Respondent 12, this research is expected to be carried out independently by female students of State Senior High School 2 Pekanbaru when experiencing menstrual pain.
2. For Research Places For research institutions, it is suggested that the William Flexion Exercise technique can be used as an additional subject for female students of Pekanbaru 2 State Senior High School in dealing with menstrual pain.
3. For further research, it is recommended that this research be developed using other techniques, or combined with other non-pharmacological techniques.
4. For Nursing Educational Institutions: Nursing educational institutions are advised to use this research as a reference for teaching materials in dictionaries related to the William Flexion Exercise technique. It can also be used as knowledge and a basis for complementary nursing and maternity nursing.

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