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The Effect of Abdominal Stretching on Menstrual Cramps (Dysmenorrhea) Among Female Teenagers at SMPN 2 Purwodadi

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abdominal stretching, dysmenorrhea, menstrual pain, adolescent girls

Abstract

Dysmenorrhea is one of the reproductive health problems that are commonly experienced by adolescent girls and can interfere with activities and quality of life. The high prevalence of dysmenorrhea indicates the need for safe and easy-to-apply nonpharmacological interventions. One method that can be used is Abdominal Stretching which functions to relax muscles and increase blood circulation so as to help reduce pain. This study aims to determine the effect of Abdominal Stretching on menstrual pain (dysmenorrhea) in adolescent girls at State of Junior High School 2 Purwodadi. Using a pre-experimental design with a one group pretest-posttest approach. The population in this study is 64 female students with a sample of 56 respondents obtained using the quota sampling technique. Pain level was measured using the Verbal Descriptor Scale (VDS) and analyzed using the Wilcoxon Signed-Rank Test. The study showed that most of the respondents experienced a decrease in pain levels after being given the Abdominal Stretching intervention, with 83.9% of respondents experiencing a decrease in pain and no increase in pain. The results of the statistical test showed a value of Z = -6.171 with a p-value of < 0.001 (p < 0.05), which means that there was a significant difference between the level of pain before and after the intervention. That Abdominal Stretching has a significant effect in reducing menstrual pain (dysmenorrhea) in adolescent girls, so that it can be used as an alternative to non-pharmacological treatment that is effective and easy to do independently.

INTRODUCTION

Adolescence is an important period in the growth and development process, one of which is characterized by the maturation of the reproductive system (Ganguly et al., 2025; Hegde et al., 2022; Ko, 2024). One of the most common reproductive system problems experienced by adolescent girls is dysmenorrhea or medically known by Latin terms *dysmenorrhea* (Amilsyah et al., 2023). Dysmenorrhea is a complaint that is often experienced by women during menstruation characterized by cramping pain in the lower abdomen caused by spasms in the uterine muscles so as to limit normal activities (Swandari et al., 2022). According to the data *World Health Organization* (WHO) in 2019 the incidence of adolescents with dysmenorrhea was 1,769,425 people, of which 10-15% were adolescents with severe dysmenorrhea. These figures show that dysmenorrhea is not just a common pain but a global reproductive health problem for adolescent girls that affects quality of life and productivity.

This condition is in line with the situation in Indonesia where the incidence rate of dysmenorrhea reaches 64.25% (Amilsyah et al., 2023). A higher prevalence was found in East Java, the prevalence of dysmenorrhea reached 90.25% based on Adolescent Reproductive Health Survey (SKRR) data in 2021. A study reported the prevalence of dysmenorrhea in adolescent girls at SMAN 7 Malang that 92.6% of female students experienced primary dysmenorrhea, with factors considered including menarche age, body mass index, stress level, and fast food consumption (Hidayat et al., 2024). While research by Silaen et al., (2021) found

that 74.42% of adolescent girls had dysmenorrhea. The study also detailed that the highest proportion of dysmenorrhea was found in adolescents aged 14-16 years, no family history of dysmenorrhea, menarche age range of 11-12 years, and menstrual cycles of 7 days or more. The tendency of the high incidence of dysmenorrhea in adolescents aged 14-16 years indicates that dysmenorrhea tends to occur in adolescent girls who are in the middle period due to the influence of fluctuating hormonal cycles. This phenomenon shows that dysmenorrhea is not just a routine complaint, but a serious health problem that requires appropriate treatment to maintain the quality of life and productivity of adolescent girls (Bolado et al., 2025; Cherenack et al., 2023; Esan et al., 2024; Pouraliroudbaneh et al., 2024).

This high prevalence suggests the need for safe, easy-to-implement, and appropriate nonpharmacological interventions for adolescent girls in the management of dysmenorrhea pain. One of the effective nonpharmacological interventions is *Abdominal Stretching*. Intervention *Abdominal Stretching* works by closing the "gates" of pain transmission at the spinal level through the activation of A-Beta nerve fibers. Simultaneously, these movements normalize the tone of the abdominal and uterine muscles through a mutual inhibition mechanism. This not only blocks pain impulses to the cerebral cortex, but also improves myometrial tissue ischemia by breaking the cycle of pain and spasm so this intervention works by relaxing the muscles of the abdominal wall to reduce muscle spasms that indirectly help relieve ischemic in the uterus which is the source of visceral pain (Purnamasari, 2025). Physiologically, dysmenorrhea is included in the category of visceral pain or deep pain which is different from other abdominal pain where the pain felt comes from the internal organs of the uterus and the pain is dull, spreading like deep cramps and difficult to localize specifically at one point caused by myometrium contraction due to excess production of prostaglandins. (Naia et al., 2024). Pain due to uterine contractions often triggers a transfer pain felt in the lower abdominal wall to the waist and triggers reflex tension in the abdominal wall muscles so that stretching interventions targeting the pelvic area are very specific to break the cramping cycle that triggers ischemia in the uterus not for abdominal pain due to indigestion (N. Anggraini & Fari, 2025). Based on research studies, pharmacological interventions, such as the use of analgesics, are indeed quite effective in reducing pain, but have limitations such as drug side effects and risk of dependence (Ganvit Tara Arjunbhai, 2025). Therefore, non-pharmacological methods are needed that are practical, safe, and can be done directly by oneself. Research Munthe et al., (2023)) prove that various body stretching techniques, including *Abdominal Stretching* which is able to reduce muscle tension, improve blood circulation, and stimulate the release of endorphin hormones that act as natural pain relievers. Based on this, *Abdominal Stretching* It can be used as the main choice to treat dysmenorrhea according to findings that show that abdominal stretching exercises are effective in reducing the intensity of menstrual pain in adolescent girls. (Main, 2023).

Based on the 2023 Pasuruan Regency Health Statistics Data, the disease rate in the female population reached 5.76%, which is higher than that of men, which is only 5.10%. These health complaints are reported to have had an impact on people's daily activities. In addition, the high number of reproductive health problems in Pasuruan Regency is reflected in the position of the region which is ranked the fifth highest in East Java (Central Statistics Agency of Pasuruan Regency, 2024). This condition is in line with the findings of researchers through a preliminary study at State of Junior High School 2 Purwodadi. Based on the results of the initial interview with UKS who said that even though the Youth Care Health Service (PKPR) program has been running, handling related physiological complaints such as dysmenorrhea is still a challenge. In addition, complaints of menstrual pain are one of the complaints that are often reported by female students and are a common reason for permission to rest in the UKS room. According to the initial data, the author conducted a further survey conducted at State of Junior High School 2 Purwodadi on November 3, 2025 on 8th grade junior high school

students, out of 88 female students, 73% experienced pain during menstruation. After further assessment of the respondents, the results were obtained that the severity of the pain of most of the students was obtained, 69% experienced mild pain which was described as cramps in the lower abdomen which could still be held even though sometimes it slightly interfered with activities but could still concentrate on studying. The remaining 31% experienced moderate to severe pain. The most common actions taken to reduce pain varied, namely 28% of female students used warm compresses, 12% took medicines or herbs, and 2% used cold compresses. However, most of the 58% of female students reported only letting the pain go away on their own or not doing special treatment for the menstrual pain felt. In addition, according to respondents, the effectiveness of pain management measures varies. As many as 61% of female students felt that the treatment (such as compresses or medications) was ineffective and they felt that the pain was still felt and came back so the treatment had to be repeated continuously every period. Meanwhile, another 39% of students admitted to feeling improvement or feeling pain disappear after treatment. That way, this shows the lack of attention of adolescent girls to the handling of health problems, especially physiological problems, namely dysmenorrhea pain.

Therefore, an effort is needed through *Abdominal Stretching* to equip students with physical skills while increasing their awareness, motivation, and confidence in handling health problems. Based on this background, the researcher is interested in conducting research on "The Influence of *Abdominal Stretching* Against Menstrual Pain (*Dysmenorrhea*) to Young Women at State of Junior High School 2 Purwodadi".

The problem formulation of this study is whether there is an effect of Abdominal Stretching on menstrual pain (dysmenorrhea) among adolescent girls at State of Junior High School 2 Purwodadi. Based on this problem, the general objective of the study is to determine the effect of Abdominal Stretching on menstrual pain (dysmenorrhea) in adolescent girls at State of Junior High School 2 Purwodadi. Specifically, this study aims to identify the level of menstrual pain (dysmenorrhea) in adolescent girls before and after being given Abdominal Stretching, as well as to analyze the effect of Abdominal Stretching on menstrual pain (dysmenorrhea) by comparing the conditions before and after the intervention at State of Junior High School 2 Purwodadi.

METHOD

Research Type and Design

This research was quantitative research with an approach *pre-experimental*. The methods used are *One-Group Pretest-Posttest Design*, i.e. a research design that measures the variables before (*Pretest*) and after (*Posttest*) was given an intervention in the same group. This design was used to assess the effect of interventions *Abdominal Stretching* Suffering from Chronic Pain (*dysmenorrhea*) in subjects who were observed directly after the intervention.

Operational Framework

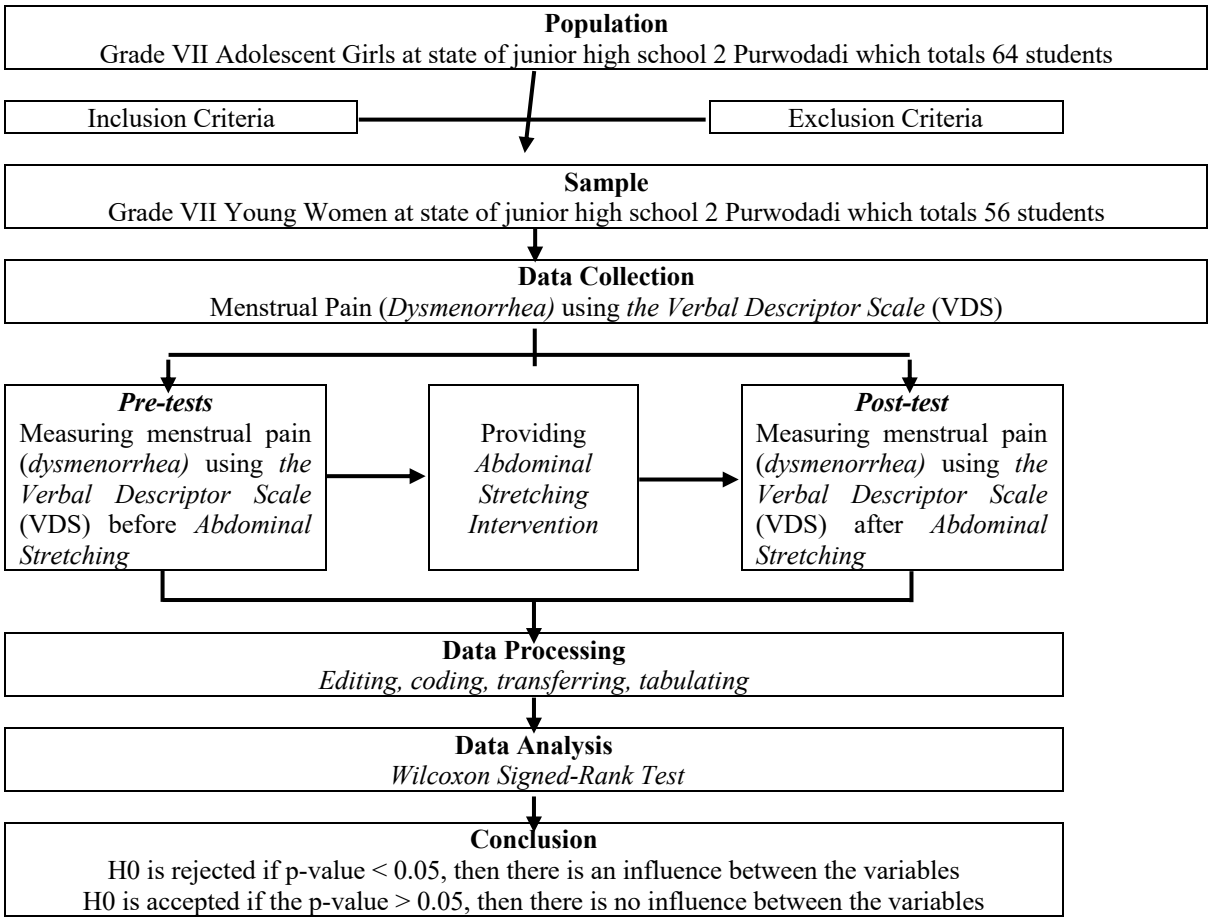

Figure 1 Operational Framework

Population and sample

Population

The population in a study is a subject (e.g. human, client) who has certain criteria in a study. The population that will be used in this study is Grade VIII Adolescent Girls at state of junior high school 2 Purwodadi. The number of adolescent girls of state of junior high school 2 Purwodadi is 64 students who qualify as the target population because they experience menstrual pain which is the object of the study.

Sample

The sample is a portion of the affordable population selected to be the source of the research data. As for ensuring that the selected sample is representative and in accordance with the characteristics of the subject being studied, a specific method, namely the sampling technique, is used.

The determination of the number of samples in this study was carried out through the Slovin formula with a margin of error of 5% (0.05). The formula used is as follows:

$$n = \frac{N}{1 + N \times e^2}$$

Description:

n : Number of Samples
N : Total Population
e : Fault Tolerance Limit (*Margin of Error)*

It is known that the number of adolescent girls in class VIII of state of junior high school 2 Purwodadi who experience menstrual pain is 64 people with an error rate of 5%, so the calculation of the number of samples is as follows:

$$= \frac{64}{1 + 64 \times 0.05^2}$$

$$n = \frac{64}{1 + 64 \times 0.0025}$$

$$n = \frac{64}{1 + 0.16}$$

$$n = \frac{64}{1.16} = 55.17$$

Thus, the number of samples used in this study is 56 female students.

Sampling Technique

The sampling technique used in this study is *non-probability sampling,* namely *quota sampling*. This technique is used when sampling is carried out based on a target number of certain quotas by ensuring that the selected participants meet the criteria that have been set.

In this study, the population consists of several classes so that sampling is carried out with a proportional quota based on the number of students in each class. For the calculation of the quota of each class, it can be seen in the following table:

Table 1 Calculation of Sampling Quota Proportion

Classes	Number of female students who experience dysmenorrhea	Calculation of the number of samples	Number of samples
8A	17	$\frac{17}{64} \times 56 = 14.8$	15
8B	13	$\frac{13}{64} \times 56 = 11.3$	11
8C	15	$\frac{15}{64} \times 56 = 13.1$	13
8D	19	$\frac{9}{64} \times 56 = 7.8$	8
8E	10	$\frac{10}{64} \times 56 = 8.7$	9
Total	**64**		**56**

Primary data processed by the researcher (2026)

a. Sample Criteria

1) Inclusion Criteria

Inclusion criteria are a common characteristic of research subjects who meet the requirements to participate in the study. The inclusion criteria for the sample in this study are:

a) Young women with dysmenorrhea
b) Young women who are willing and actively participating as research respondents
c) Young women who have a relatively regular menstrual cycle of 21 – 35 days

2) Exclusion Criteria

Exclusion criteria are characteristics that cause subjects to be excluded from the study, even if they meet the inclusion criteria, as they can affect the results of the research's research. Sample exclusion criteria in this study:

a) Young women who do not follow the filling out of the *Pre/Post test* questionnaire according to the agreed schedule

b) Young women who resign amid research
c) Young women who have a bone injury or abnormality in the bones
d) Young women who take analgesic medications or perform other pain relief interventions outside of *Abdominal Stretching*
e) Adolescent girls who experience a drastic increase in pain scale when performing *Abdominal Stretching movements*

Research Variables

Research variables are everything in the form of anything that is determined by the researcher to be studied so that information about it is obtained, then conclusions are drawn.

1. Independent Variables

The independent variable in this study was *Abdominal Stretching*, which is an intervention given to adolescent girls to reduce the intensity of dysmenorrhea.

2. Dependent Variable

The results of *this study are* based on the effects of menstrual pain (dysmenorrhea) as *measured* using a Verbal Descriptor Sca (VDS) tool prior *to the intervention of Stretching* Therapy.

Operational Definition

Table 2 Research Operational Definition

Variable	Definition	Measuring instruments	Scale	Indicator
Abdominal Stretching	Physical activity in the form of stretching the abdominal muscles is done once with a duration of 5-10 minutes and is carried out by the subject during menstrual pain with standard instruction guides.	SOP *Abdominal Stretching*	-	-
Menstrual Pain (*Dysmenorrhea)*	The severity of pain in dysmenorrhea was measured using a Verbal Descriptor Sca (VDS) tool 5 minutes before and 5 minutes after the intervention.	*Verbal Descriptor Scale* (VDS)	Ordinal	No Pain = 1 Mild Pain = 2 Moderate Pain = 3 Severe Pain Controlled = 4 Uncontrolled Severe Pain = 5

Primary data processed by the researcher (2026)

Location and time

This research was Hosted at state of junior high school 2 Purwodadi. As a Paulo Planning to Researchers Starting August 2025 to April 2026 within Gathering Activities in D'Agostino period February 2026.

Data Collection Tools

The collection of data is a research instrument that is a method used by researchers to collect data in a systematic manner so that the data is obtained and analyzed. That is the conclusion of the Smash Bros. series. These instruments can be in the form of questionnaires, observations, observations, documents, and special measures that are relevant to the researcher's needs. A collection of data collected by the researchers in this study:

Dysmenorrhea Scale

Use a *Verbal Descriptor Sca* (VDS) to measure the intensity of the subject's dysmenorrhea pain prior to the following Stretching *intervention*.

General Data Collection

a. The data is collected in the form of a general data questionnaire of respondents in the form of a Google Form containing 9 questions including the selection of a questionnaire and a questionnaire. A complete list of questions can be found in Appendix 2.
b. It is used to obtain information about perception, perception, and subjective perceptions of the daughter of dysmenorrhea.
c. This is not descriptive and is not used as a test or hypothesis.

Data Collection Methods

Data collection is a process of approaching the subject and the process of collecting the characteristics of the subject required in research.

Research Instruments

In this study, the main measurement tool *is the Verbal Descriptor Scale* (VDS) used to assess pain in dysmenorrhea.

a. *Verbal Filling Descriptor Scale* (VDS)

The data collection process was carried out behind closed doors which was designed based on research variables.

b. Scorsoring

Each answer to the data collection results was given a score that corresponded to the score from before and after data collection.

c. Category Determination

Table 3 Categories *Verbal Descriptor Scale* (DVS)

Score	Categories
No Pain	1
Mild Pain	2
moderate pain	3
Controlled Severe Pain	4
Uncontrolled Severe Pain	5

Primary data processed by the researcher (2026)

Primary Data Collection

Primary data is a source of data obtained directly from the research sample.

a. Data Collection Distribution

1) In the form of questionnaires, general data of respondents as well as pre-test and post-test data are distributed online using Google forms.
2) A copy of the application form is submitted to the Student Loan Forgiveness Department, which is the first step in the process of applying for a scholarship.
3) O 'Neill is a member of the O'Neill Chamber of Commerce, and he is a member of the Chamber of Commerce.

b. Data Collection Filling

1) The researcher introduced *Abdominal Stretching movements* in the form of a 3-day joint exercise with expert instructors at state of junior high school 2 Purwodadi which was attended by all respondents.
2) The researcher collected pre-test and post-test data directly at state of junior high school 2 Purwodadi under the supervision of an instructor to measure the level of pain change before and after *the Abdominal Stretching intervention* at the time the respondent experienced menstrual pain and the value was absolute based on the level of pain felt by the respondent.

3) Each respondent was asked to fill out all questions within 5-10 minutes which included the following filling conditions.

a) Filling out the respondents' general data questionnaire is carried out before filling out the pre-test.

b) The pre-test filling is done at the time of menstrual pain 5 minutes before doing *Abdominal Stretching.*

c) Post-test filling is carried out during menstrual pain 5 minutes after doing *Abdominal Stretching.*

c. Data Security

1) The identity of the respondent is the identity of the respondent. That is why it is important to note that the Melanie Anonymous Response Team.

2) The autofill data is stored in Google Drive and can only be accessed by researchers and supervisors.

1. Secondary Data Collection

a. Collection of Official Documents

The researcher asked for secondary data from the Administration section in the form of attendance of 8th grade students of state of junior high school 2 Purwodadi.

b. Literature Studies

The source of written data obtained from documents related to dysmenorrhea problems is through the student attendance book from the school.

How Data Is Processed

1. Data Management

a. Editing

The researcher re-checked the data obtained by ensuring that the identity and measurement results that had been carried out *by Abdominal Stretching* were complete.

b. Codding

The researcher provides a code to the data consisting of several categories to be used in data processing and interpretation.

1) General Data

a) Code Responders

1 = Respondents 1
2 = Respondents 2
n = Respondents n

b) Age

1 = Age 13
2 = Age 14
3 = 15 years old

c) How long is the cycle (the distance between one month and the next) in your period?

1 = < 21 Days
2 = 21-35 Days
3 = > 35 Days

d) How many (long) average periods do you have in a day?

1 = < 7 Days
2 = 7 Days
3 = > 7 Days

e) Are you sure you don't want to be the one to make the mistake of trying to get rid of all the bugs?

1 = between the 1st-10th / beginning of the month
2 = between the 10th-20th / middle of the month
3 = between the 20th-30th / end of the month

f) When do you usually start feeling menstrual pain (dysmenorrhea)?
1 = 3 days before menstruation
2 = equal to the first blood
3 = After the 3rd day of menstruation
g) When dysmenorrhea pain comes, how often does it interfere with your daily activities (school, study, etc.)?
1 = Never
2 = Sometimes
3 = Frequent
4 = Always
h) Do you regularly do physical activity/exercise at least 3 times a week?
1 = Yes
2 = No
i) Before this study began, have you ever heard of or know about *Abdominal Stretching* as a way to reduce menstrual pain?
1 = Yes, ever
2 = Never
j) If "Yes" (know), where is your main source of information about *Abdominal Stretching* for menstrual pain?
1 = Health Workers
2 = social media (Internet)
3 = Teacher
4 = Books
5 = Friends
6 = Family/Parents
2) Custom Data
The level of pain felt
1 = No Pain
2 = Mild Pain
3 = moderate pain
4 = Severe Pain Controlled
5 = Uncontrolled Severe Pain
c. *Transfer*
All data obtained by researchers is transferred to a master sheet
d. *Tabulating*
The researchers then changed the frequency distribution to be calculated by presenting a younger person to be tested.
2. Data Analysis
a. Univariate Analysis

The univariate analysis in this study aims to describe the basic characteristics of the research subject and describe each variable separately. The data analyzed univariately include:
1) Subject Characteristics:
At the same time, menstruation, menstrual pain, physical activity, and the ability *to stretch are not the same*. This is because the frequency is a fraction of the frequency.
2) Outcome Variables:

It was measured using *the Verbal Descriptor Scale* (VDS) which is ordinal scale. The data is presented with medians, minimums, and maximums and the data will be presented in the form of frequency and percentage distributions.
b. Bivariate Analysis

Bivariate analysis was used to test the effect of *Abdominal Stretching* on menstrual pain (*dysmenorrhea*) by comparing *pretest* and post-test values. The statistical test used in determining the hypothesis test is using *the Wilcoxon Signed-Rank Test*. The statistical decision is based on the p-value compared to $\alpha = 0.05$. If the p-value < 0.05, then H0 is rejected, which means that there is a significant effect of *Abdominal Stretching* on menstrual pain (*dysmenorrhea*).

Research Ethics

This research has been carried out Sigh.ng Hosted at Keseha Polytechnic Ministry of Health with Number: DP.04.03/F.XIII.31/0192/2026. Here are some Ethical Principle That is used D'Agostino this research includes:

1. *Informed Consent*

Before the implementation of the research, the respondents were given an approval sheet containing information about:

a. Research objectives
b. Procedure to be performed
c. Benefits respondents can get

Respondents who are willing to participate in this study sign an agreement sheet as a form of willingness to be a research subject.

2. *Anominity* (Anonymous)

In the research instrument, the respondent's real name was not listed. Instead, each respondent was given a unique code to protect privacy and maintain anonymity throughout the research process.

3. *Confidentiality*

The information obtained by the researcher from the respondents is kept confidential and is only used for research purposes. The data collected is not disseminated and is not used for other purposes without the consent of the respondent.

4. *Voluntary Participation*

Participation in this study is voluntary. There was no coercion or pressure on respondents to participate in the study. Respondents also have the right to resign at any time without having to give a reason, and this decision will not adversely affect them.

5. *Justice*

All respondents were treated fairly without discrimination. The study also ensures a balance between the benefits that respondents get and the risks they may face. The researcher ensured that the respondents' rights were fully protected.

6. *Ethical Clearance*

The researcher has conducted *an Ethical Clearance test* at the Health Research Ethics Commission of the Ministry of Health of the Ministry of Health of Malang. This is done to ensure that all research procedures have met the standards of human rights protection, subject safety, and moral principles in health research.

RESULTS AND DISCUSSION

Data Distribution

Frequency of Age

Table 4 Distribution of Respondent Age Data

Age	Frequency	Present (%)
13 Years	24	42.86
14 Years	24	42.86
15 Years	8	14.29
Total	56	100%

Primary data processed by the researcher (2026)

The majority of respondents were 13 and 14 years old, respectively 24 people (42.86%), while 15 years old amounted to 8 people (14.29%). Thus, most of the respondents were included in the early adolescent category, with a total sample of 56 people.

Frequency Length of Distance Next Cycle

Table 5 Frequency Based on Distance Between Menstrual Cycles

Distance Between Subsequent Cycles	Frequency	Present (%)
< 21 Days	-	-
21 – 35 Days	56	100
> 35 Days	-	-
Total	56	100%

Primary data processed by the researcher (2026)

All respondents had a menstrual cycle distance in the normal range of 21–35 days, which was 56 people (100%), without any respondents with cycles outside this range.

Average Frequency of Menstruation Duration

Table 6 Based on the length of menstruation

Average Menstrual Length	Frequency	Present (%)
< 7 Days	14	25
7 Days	35	62.5
> 7 Days	7	12.5
Total	56	100%

Primary data processed by the researcher (2026)

The majority of respondents experienced a menstrual period of 7 days (62.5%), followed by less than 7 days (25%) and more than 7 days (12.5%). This shows that most respondents have menstrual durations within the normal range.

Frequency of Menstrual Dates Every Month

Table 7 Based on the frequency of menstrual dates each month

Menstrual Dates Every Month	Frequency	Introduce yourself
Between 1-10 Beginning of the Month	14	25%
Between 10-20 Mid-Moon	27	48.21%
Between 20-30 End of the Month	15	26.79%
Total	56	100%

Primary data processed by the researcher (2026)

The majority of respondents experienced menstruation in the middle of the month (48.21%), followed by the end of the month (26.79%) and the beginning of the month (25%). This variation in menstrual time shows that there are differences in menstrual cycle patterns between respondents, which can indirectly reflect the regularity of the menstrual cycle. However, in this study, these variables were not further analyzed on the level of menstrual pain.

Frequency of Pain Felt

Table 8 Based on the frequency of pain

Experiencing Pain	Frequency	Present (%)
First Blood Equivalent	34	60.71
3 Days Before Menstruation	15	26.78
After the 3rd day of menstruation	7	12.5
Total	56	100%

Primary data processed by the researcher (2026)

The majority of respondents experienced pain at the beginning of menstruation (60.71%), followed by 3 days before menstruation (26.78%) and after day 3 (12.5%). This shows that menstrual pain generally occurs in the early phase of menstruation.

How Often Menstrual Pain Is Frequent

Table 9 Based on the Frequency of Menstrual Pain Events

How Often Is Menstrual Pain	Frequency	Present (%)
Never	-	-
Sometimes – Sometimes	35	62.5
Frequent	21	37.5
Total	56	100%

Primary data processed by the researcher (2026)

The majority of respondents experienced menstrual pain at some point (62.5%), followed by frequent (37.5%), with no respondents never experiencing pain. This shows that all respondents have experienced menstrual pain with varying frequency.

Frequency of Exercise 3 Times a Week

Table 10 Based on the frequency of exercise habits

Exercise 3 times a week	Frequency	Present (%)
Exercise	14	25
Not exercising	42	75
Total	56	100%

Primary data processed by the researcher (2026)

The majority of respondents did not exercise three times a week (75%), while 25% did. This shows that most of the respondents have low exercise habits.

Tabulation of *Abdominal Stretching* Data on Dysmenorrhea Pain

Table 11 Data *Abdominal Stretching* Against Dysmenorrhea Pain

Yes	Menstrual Pain	Pre-Test	Post-Test	*p-Value*
1	No Pain	0	18	< 0.001,
2	Mild Pain	12	33	
3	moderate pain	34	5	
4	Controlled Severe Pain	10	0	
5	Uncontrolled Severe Pain	0	0	
	Total	56	56	

Primary data processed by the researcher (2026)

The table shows that before the intervention, the majority of respondents experienced 34 moderate pain and 12 mild pains, and there were still 10 controlled severe pain. After the intervention, there was a shift to a milder pain level, i.e. no pain as many as 18 and mild pain as many as 33, while moderate pain decreased to 5 and severe pain was not found. The results of *the Wilcoxon* $p < 0.001$ test showed that the change was significant.

Variable Analysis

Table 12 Analysis Results *Wilcoxon Signed-Rank Test*

Ranks		N	Red Ranks	Sum of Ranks
Pretest & Post-test	Negative Ranks	47a	24.00	1128.00
	Positive Ranks	0b	.00	.00
	Ties	9c		
	Total	56		

Primary data processed by the researcher (2026)

The results of the Wilcoxon test showed that 47 respondents experienced a decrease in pain, no improvement, and 9 did not experience any change, with a p value of < 0.05. This shows that the intervention has a significant effect on reducing dysmenorrhea pain.

Table 13 Results of the Influence of Analysis

Test Statistic	Post-test & Pretest
Z	-6.171b
Asymp. Sig. (2-tailed)	<.001

Primary data processed by the researcher (2026)

The results of the Wilcoxon test showed a value of Z = -6.171 with p < 0.001, which indicates a significant difference between *the pretest* and the post-test. These findings confirm that *Abdominal Stretching* is effective in lowering dysmenorrhea pain in respondents.

Identification of Menstrual Pain (*Dysmenorrhea*) Before and After *Abdominal Stretching*

Based on the results of the study, in the pre-intervention conditions (pretest) the majority of respondents had experienced menstrual pain with varying frequency, namely most were in the category of sometimes experiencing pain 62.5% and often experiencing pain 37.5%, and there were no respondents who had never experienced 0% pain. Menstrual pain appeared most on the first day of menstruation at 60.71%, followed by three days before menstruation at 26.78% and after the 3rd day of menstruation at 12.5%, indicating that pain tends to be concentrated in the early phases of menstruation. In addition, all respondents had a normal menstrual cycle (21–35 days) with a seven-day menstrual length of 62.5%, so this condition reflects the characteristics of primary dysmenorrhea that are common in adolescents.

After being given *Abdominal Stretching intervention*, there was a change in the level of menstrual pain, where most of the respondents experienced a decrease in pain, there were no respondents who experienced an increase in pain, and there were a small number of respondents who did not experience changes. This indicates a shift in the distribution of pain levels towards milder after the intervention was given.

When compared between before and after the intervention, there was a significant change from the dominant pain condition to a milder or controlled condition. These results show that there is a decrease in pain levels after the administration of *Abdominal Stretching intervention*. According to the authors, the dominance of pain reduction without any improvement indicates that *Abdominal Stretching* is a relatively safe and effective non-pharmacological intervention. However, the presence of respondents who did not experience changes indicated that responses to interventions could be influenced by individual factors, such as pain thresholds and physiological conditions of each respondent.

Thus, the results of this identification show that menstrual pain was the dominant condition before the intervention and improved after the administration of *Abdominal Stretching*, which was characterized by a decrease in pain levels in most respondents. This change is not only noticeable in the results of this study, but it is also in line with various findings of previous studies that show a pattern of decreased pain after the administration of *Abdominal Stretching.*

Research shows that before the intervention, most respondents experienced dysmenorrhea with a fairly dominant level of pain, but after being given exercise *Abdominal Stretching* there is a noticeable decrease in pain levels (Sutrisni, et al. 2021). These findings reinforce that the respondents' initial condition was dominated by pain experiences, and after the intervention there was a shift towards milder levels of pain.

Other studies have also shown that the intensity of menstrual pain decreases after administration *Abdominal Stretching* , both before and during menstruation (Amilsyah et al., 2023). This is in line with the results of this study which shows that the dominance of respondents experienced a decrease in pain. According to the authors, this indicates that the intervention *Abdominal Stretching* effective in reducing pain in general in various phases of menstruation.

Similar results were also found in studies that showed differences in pain levels before and after the intervention, which illustrated a shift in pain conditions towards milder (Puji Lestari et al., 2023). dysmenorrhea as a common condition in adolescents has also been shown to improve after non-pharmacological interventions such as *Abdominal Stretching* (Roberts, 2022). According to the author, this reinforces that *Abdominal Stretching* is an effective and applicable intervention in the management of menstrual pain.

Theoretically, changes in the level of menstrual pain before and after the administration of *Abdominal Stretching* in this study can be explained through the theory of gate control and stretch reflex. Based on the gate control theory, pain perception is influenced by modulation mechanisms in the nervous system, where the stimulation of mechanoreceptors through muscle stretching can inhibit the transmission of pain impulses to the brain. In this study, the condition before the intervention dominated by respondents with pain showed that pain modulation was not optimal, while after the administration *of Abdominal Stretching* there was non-nociceptive nerve fibre stimulation that contributed to a decrease in pain perception.

In addition, based on the concept of stretch reflex, muscle stretching done in a controlled manner can reduce muscle tension and increase relaxation. In pre-intervention conditions, the abdominal muscles tended to tense so that pain worsened, while after the intervention there was neuromuscular adaptation in the form of a decrease in excessive contraction reflexes and an increase in strain tolerance. This causes the muscles to become more relaxed and reduces the spasms that contribute to pain.

According to the authors, the combination of pain modulation mechanisms through gate control and muscle relaxation through stretch reflex explains physiologically why *Abdominal Stretching* is able to reduce menstrual pain in most respondents. Thus, the pain reduction identified in this study is not only descriptive, but also has a strong theoretical basis.

When viewed from an obstetric perspective, the condition of menstrual pain in the respondents is included in the characteristics of primary dysmenorrhea which is physiological, because all respondents have normal menstrual cycles and lengths. However, the predominance of pain before intervention suggests that there are still limitations in self-management, which has the potential to interfere with adolescents' activities and quality of life.

After *Abdominal Stretching*, there was a reduction in pain in most of the respondents, which shows the effectiveness of non-pharmacological interventions in helping adolescents manage menstrual pain independently. According to the author, this reflects that the midwifery approach based on education and empowerment is able to increase independence in maintaining reproductive health.

Overall, *Abdominal Stretching* can be recommended as a safe, simple, and applicable intervention. In addition to reducing pain, this intervention also contributes to improving the quality of adolescent reproductive health through promotive and preventive approaches.

The Effect *of Abdominal Stretching* on Menstrual Pain (*Dysmenorrhea*)

Based on the results of the study, the administration of *Abdominal Stretching* showed a significant effect on reducing the level of menstrual pain in respondents. Descriptively, before the intervention, the majority of respondents experienced menstrual pain with occasional and frequent frequency, as well as the time of the appearance of dominant pain at the beginning of menstruation. This condition shows that the respondent is in the characteristics of primary dysmenorrhea, so the intervention provided is relevant to the problem experienced.

After the intervention, most of the respondents experienced a decrease in pain, no respondents experienced an increase in pain, and a small percentage of respondents did not experience any changes. This pattern shows a consistent tendency to decrease pain. Statistically, the results of *the Wilcoxon Signed-Rank Test* showed a value of $Z = -6.171$ with a p-value of < 0.001, which confirms that there is a significant difference between the level of

pain before and after the intervention. This indicates that the changes that occur are not accidental, but are the effects of the intervention given.

However, the effectiveness of this intervention cannot be separated from the characteristics of respondents. All respondents had normal menstrual cycles, so the decrease in pain was more reflective of the response to the intervention in physiological conditions, rather than the result of changes in pathological conditions. In addition, the majority of respondents have a low level of physical activity, so the administration of *Abdominal Stretching exercises* provides a new stimulus that can strengthen the pain-reducing effect.

On the other hand, the variation in respondents' knowledge of *Abdominal Stretching* and the presence of a small number of respondents who did not experience changes indicated that the response to the intervention was not completely homogeneous. Factors such as pain threshold, adherence in performing exercises, psychological conditions, as well as differences in individual physiological responses can affect the results obtained.

According to the authors, these findings indicate that *Abdominal Stretching* is an effective, safe, and applicable non-pharmacological intervention in reducing menstrual pain, especially in adolescents with primary dysmenorrhea. However, to obtain optimal results, the application of these interventions needs to consider individual factors, so that their effectiveness can be more consistent across different population conditions. These results are in line with various previous studies that show similar patterns of findings related to the effectiveness of *Abdominal Stretching* in reducing menstrual pain.

Research shows that before the intervention, most respondents experienced menstrual pain of a certain intensity, and after being given exercise *Abdominal Stretching* there is a significant decrease in pain (Khoirunnisa & Wisnu Wardhani, 2022). These findings are consistent with the results of this study, where the majority of respondents experienced a decrease in pain without any improvement, thus reinforcing that the intervention provides a consistent effect in reducing pain.

In addition, other studies have also shown that *Abdominal Stretching* Effective as a non-pharmacological intervention in reducing dysmenorrhea pain in adolescent girls (Rodiah & Hidayanti, 2022). The results of the study showed a decrease in pain levels after the intervention was given. This is in line with the results of this study which showed the dominance of negative ranks and the absence of positive ranks, which indicates that the changes that occur consistently lead to a decrease in pain.

Other studies with pretest–post-test designs have also shown that *Abdominal Stretching* exercise can significantly reduce the intensity of menstrual pain (Nurfitri et al., 2021). These findings reinforce the results of statistical tests in this study ($p < 0.001$) which show that the decrease in pain does not occur by chance, but is an effect of the intervention given.

Furthermore, the findings are also reinforced by other studies that explain that *Abdominal Stretching* Exercise is effective in lowering the intensity of dysmenorrhea through the mechanism of increasing blood circulation and decreasing muscle spasms (Fatmawati et al., 2021). This result is relevant to the condition of the respondents in this study, the majority of whom have low physical activity, so that the administration of stretching exercises has a more pronounced impact on reducing pain. Based on some of the results of the study, it can be understood that the findings in this study are in accordance with previous research which states that *Abdominal Stretching* is an effective non-pharmacological method to reduce dysmenorrhea pain in adolescent girls.

The effect *of Abdominal Stretching* on the reduction of menstrual pain in this study can also be explained through the theoretical approach of gate control and stretch reflex which provides a physiological basis for the mechanism of pain reduction. Based on the gate control theory, the perception of pain is determined not only by the pain stimulus itself, but also by the modulation mechanisms in the central nervous system, specifically in the spinal cord. Activities

such as *Abdominal Stretching* can stimulate non-nociceptive nerve fibres (A-beta fibres) that play a role in "closing the pain gate", thus inhibiting the transmission of pain impulses from the uterus to the brain. This is relevant to the results of the study which showed that none of the respondents experienced an increase in pain and the majority experienced a decrease in pain, which indicates that the intervention provides an effective and consistent pain modulation effect.

Additionally, from a stretch reflex perspective, stretching the abdominal muscles can affect the neuromuscular response to stretching. In dysmenorrhea, increased abdominal muscle tension can worsen pain, but through *Abdominal Stretching* there is an adaptation that suppresses excessive contraction so that the muscles become more relaxed and not easily spasm. This contributes to a decrease in respondents' pain. This effect was reinforced by the results of statistical tests ($p < 0.001$) which showed that the findings were not only descriptive, but also had a physiological basis through gate control and stretch reflex mechanisms.

The findings also show that *Abdominal Stretching* is an effective promotive and preventive intervention in treating dysmenorrhea in adolescents. The respondents' condition, which is dominated by cycles and normal menstrual lengths, confirms that the pain that occurs is physiological, so non-pharmacological intervention is the right choice. The dominance of pain reduction in the absence of improvement suggests that this method is effective, safe, and can be applied as a standalone intervention in obstetric practice.

In addition, the low physical activity of the respondents strengthens the relevance of *Abdominal Stretching* as a form of body stimulation. Adolescents with low activity tend to have lower pain tolerance, so stretching has a significant impact. However, the presence of a small number of respondents who did not experience changes suggests that the effects of the intervention are not uniform, so it is necessary to consider individual factors such as adherence and physiological conditions for optimal outcomes.

From an obstetric perspective, the effect *of Abdominal Stretching* on the reduction of menstrual pain reflects the effectiveness of promotive and preventive obstetric care approaches in treating dysmenorrhea in adolescent girls. Primary dysmenorrhea is a common physiological condition in adolescents, especially early age such as the respondents in this study who were dominated by 13–14 years old. This is reinforced by the characteristics of the respondents who all have normal menstrual cycles and the majority of menstruation lengths within physiological limits, so that the pain experienced is more related to the natural menstrual process. The results of the study showing the dominance of pain reduction and the absence of improvement confirm that *Abdominal Stretching* is an effective, safe, and non-pharmacological intervention that can be used as an independent intervention in obstetric practice that is also oriented towards empowering adolescents to manage pain simply and independently.

In addition, the low physical activity of the respondents reinforces the relevance of *Abdominal Stretching* as a strategy for improving physical condition and reducing pain, as adolescents with low activity tend to have lower pain tolerance. In this context, midwives play the role of educators in providing information and training on *Abdominal Stretching* techniques as part of reproductive health education. However, the presence of a small number of respondents who did not experience changes showed that the response to the intervention was not uniform, so the approach in midwifery care still needed to be individual by considering the compliance, physical condition, and physiological response of each adolescent so that the results obtained were more optimal.

Research Limitations

This study has a major limitation in the design aspect, namely using *a one group pretest–post-test* without a control group, so that the change in pain level cannot be fully attributed only to *the Abdominal Stretching* intervention. In addition, subjective pain measurement is also a limitation, because it is greatly influenced by individual perception and respondents' pain

threshold. Therefore, the interpretation of the research results needs to be carried out carefully by considering these limitations.

CONCLUSION

The findings of this study demonstrate that Abdominal Stretching is an effective non-pharmacological intervention for reducing menstrual pain (dysmenorrhea) among adolescent girls at state of junior high school 2 Purwodadi. The results show a significant decrease in pain intensity after the intervention, as evidenced by the shift from moderate and severe pain categories to mild or no pain, supported by statistical analysis using the Wilcoxon Signed-Rank Test ($Z = -6.171$; $p < 0.001$). This indicates that the intervention provides a meaningful physiological impact, likely through mechanisms of muscle relaxation, improved blood circulation, and modulation of pain perception via gate control theory. Furthermore, the absence of increased pain among respondents highlights the safety and applicability of Abdominal Stretching as a simple, cost-effective, and independent self-care strategy for adolescents. Overall, this study confirms that Abdominal Stretching can be recommended as a promotive and preventive approach in managing primary dysmenorrhea, particularly in populations with low physical activity levels. However, this study has several limitations, including the use of a one-group pretest–post-test design without a control group and reliance on subjective pain measurements, which may affect the generalizability of the results. Therefore, future research is recommended to employ more rigorous experimental designs, such as randomized controlled trials, to strengthen causal inferences regarding the effectiveness of Abdominal Stretching. Additionally, future studies should consider larger and more diverse populations, incorporate objective physiological measurements, and explore the long-term effects and optimal frequency of the intervention. It is also suggested to examine the influence of moderating variables such as physical activity level, psychological factors, and adherence to exercise routines. Expanding research in this area will contribute to the development of more comprehensive and evidence-based strategies for managing dysmenorrhea among adolescents.

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