



Controlling Menstrual Pain Using Dysmenorrhea Physical Exercise in Young Women

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ABSTRACT

Background: Adolescents in the age range 12 – 17 years are characterized by physical and psychological maturity. one of the physical maturity of adolescent girls since menstruation occurs and the growth of secondary sexual signs. Menstrual periods in teenagers can cause pain due to uterine contractions. The incidence of menstrual pain in Central Java is 56% which is quite high when compared to the incidence of primary menstrual pain in Indonesia. For young women, menstrual pain is at risk of causing learning disorders in the form of lack of enthusiasm, decreased concentration and even not going to school and can reduce the Quality Of Life (QOL). This research was conducted on young women at Senior High School 1 Gebog Kudus to apply Evidence Based Practice (EBP) physical exercise for dysmenorrhea to reduce the incidence of menstrual pain.

Method : The research method uses a Quasi Experiment with a One Group Pre Test – Post Test research design. Three (3) methods were used to collect data with total sample, stratified random sampling and purposive sampling.

Results: Based on the dysmenorrhea physical exercise treatment of 32 respondents, it was found that the average level of pain before being given dysmenorrhea physical exercise treatment was 6.88 and the average after treatment was 3.23. The average difference before and after is 3.63 with a p value of 0.000. These data show that there is a statistically significant difference in the average level of pain before and after dysmenorrhea physical exercise treatment.

Conclusion: Menstrual pain on young women can be controlled with dysmenorrhea physical exercise activities.

INTRODUCTION

The young women category is in the age range 12 – 17 years, characterized by physical and psychological maturity. Physical maturity of adolescent girls since menstruation and the growth of secondary sexual signs (Sinaga, 2017).

Menstruation is the normal turnover of endometrial tissue, influenced by the hormones estrogen and progesterone due to the absence of fertilization. The duration of menstruation is between 3-7 days with a cycle of 21-35 days (Harfiz, A. K., Silvia, M., Wiweko, 2018).

Menstruation may be accompanied by pain or dysmenorrhea (Harfiz, A. K., Silvia, M., Wiweko, 2018). Menstrual pain occurs due to uterine contractions. The incidence of menstrual pain in the world is quite large, more than 50% of women in every country experience this problem. The World Health Organization (WHO) reports that 90% of women experience menstrual pain menstruasi (Romlah & Agustin, 2020). In Indonesia, the prevalence of menstrual pain is 64.25%, 54.89% experience primary menstrual pain and 9.36% experience secondary menstrual pain (Herawati, 2017). The incidence of menstrual pain in Central Java is 56% which is quite high when compared to the incidence of primary menstrual pain in Indonesia. Menstrual pain is a natural occurrence, not dangerous but can interfere with daily activities (Fatmawati et al., 2016). According to previous research on 34 respondents, it shows that middle (17.6%) and late (83.5%) teenagers are prone to experiencing menstrual pain (Nurjanah, I., Yuniza, Y., & Iswari, 2019). For young women, menstrual pain is at risk of causing learning disorders in the form of lack of enthusiasm, decreased concentration and even not attending school (Anugraheni & Wahyuningsih, 2013). Several studies state that menstrual pain can be accompanied by headaches, emotional changes, insomnia, disturbed activities, nausea (Sormin, 2014 and Elsera et al., 2022). Menstrual pain during adolescence occurs due to increased function due to development, especially of the uterine nerves, so that the secretion of prostaglandin hormones increases. An increase in the hormone prostaglandin can cause mild to severe pain (Isa et al., 2017 dan Nurjanah, I., Yuniza, Y., & Iswari, 2019). Severe pain felt during menstruation can reduce the quality of life (QOL) of teenagers (Almanasef & Alqarni, 2023).

To reduce menstrual pain can use non pharmacological

therapy. Teenagers should use this therapy because it is safe and has minimal side effects. non pharmacological therapy, it can be done with warm compress, warm baths, yoga, distraction, massage, rest and exercise/ physical training. Apart from that, it is safer to prevent it by doing physical exercise or dysmenorrhea exercises (Marlinda, 2013). Dysmenorrhea physical exercise is stretching and strengthening muscles, especially in the abdomen and lower back, 3 - 4 times a week before menstruation with a duration of 30 - 45 minutes. This exercise is to increase muscle strength, endurance and flexibility, so it is hoped that it can reduce menstrual pain. This exercise is cost-free, easy, requires no equipment and no side effects (Diati., 2011).

Based on a preliminary study on 20 female students at Senior High School 1 Gebog Kudus, it showed that 15 female students experienced menstrual pain on the first to second day. Students have made various efforts to reduce pain, such as taking pain relievers, sleeping with eucalyptus oil, drinking water, not doing activities, but up to now the students have not been able to control it optimally. Appropriate action is needed to overcome this problem through light, easy physical exercise intervention, namely dysmenorrhea physical exercise. Based on this phenomenon, it is important to know how physical exercise can control menstrual pain in teenagers. High school teenagers are one part of the community group who have the right to receive nursing care. Nursing care management can be provided to a group of teenagers through the application of Evidence Based Practice (EBP) and nursing theory.

Through dysmenorrhea physical exercise activities that can help female students in Senior High School 1 Gebog who experience menstrual pain while implementing EBP, this group can regain optimal levels of health, prosperity and be able to deal with menstrual pain well. Implementation of EBP physical exercise for dysmenorrhea can reduce the incidence of menstrual pain in young women. This physical exercise involves moving certain body parts rhythmically to support abdominal muscle strength and increase endorphin hormones. The exercise method consists of 3 parts, namely 15 warm-up movements, 10 core movements and 7 cool-down movements with a total of 32 movements for 30-45 minutes accompanied by music. Dysmenorrhea physical exercise is exercise to control menstrual pain. Research on dysmenorrhea exercise has been widely carried out in Indonesia on teenagers, but there has never been any research on

how to control menstrual pain.

Therefore, researchers are interested in providing non-pharmacological therapy to control pain during menstruation. The research that will be carried out is controlling menstrual pain with physical exercise for dysmenorrhea in young women at Senior High School 1 Gebog Kudus 1 Gebog Kudus. The formulation of the problem that arises in this research is whether menstrual pain can be controlled with physical exercise for dysmenorrhea in young women at Senior High School 1 Gebog Kudus?

METHODS

This research is quantitative research with cross sectional research methods. Quantitative research is structured research from the beginning of the research to the end of the research. Quantitative research is structured scientific research on phenomena and their relationships. Quantitative research methods are research with tools for data processing using statistics, therefore the data obtained and the results obtained are in the form of numbers. Quantitative research places great emphasis on objective results (Syafrida Hafni Sahir, 2022).

This research uses a Quasi Experiment research method with a One Group Pre Test – Post Test Design research design. The quasi-experimental method is a research method by determining groups that are not chosen randomly (Sugiono, 2013). A quasi-experimental design meets at least one of the three requirements of a true experimental design, namely that the sample is taken randomly (randomization), there is manipulation (intervention), and there is a control group (Polit & Beck, 2010). This research design meets 2 requirements, namely randomization and intervention. In the quasi-experimental method, researchers must provide treatment and examine changes in the treatment that has been given. This design aims to determine the control of menstrual pain before and after doing dysmenorrhea activity exercises. This study only used one intervention group. The intervention group is a group that is given treatment and examines the before and after conditions. The population and sample in this study were class X in young women at Senior High School 1 Gebog Kudus. Three (3) methods were used to collect data with total sample, statifield random sampling and purposive sampling.

Total sample: This activity was carried out to find out the entire population of X A-E young women Senior

High School 1 Gebog Kudus, namely the entire population, namely 100 female students. Researchers provided 100 informed consents to be conveyed to parents. Each class consists of 20 female students.

Statifield random sampling : This activity was carried out to determine the number of samples from each class. To determine the number of samples to be taken, use the formula:

$$n=N \times 25\%$$

Information :

n = number of samples

N = total population

$$n=100 \times 25\%$$

$$n=100 \times 0,25$$

$$n=25$$

To anticipate respondents dropping out, the researchers added 25% of respondents.

$$\text{Drop out } 25\% = 25 \times 25\%$$

$$= 25 \times 0.25$$

$$= 6.25 \text{ rounded to } 7$$

Based on the calculation, the number of samples that will be used in this research is 25 class X young women, plus 7 students to anticipate drop out. So, the total sample size was 32 class X young women at Senior High School 1 Gebog Kudus. Each sample for each class must be proportional to the population, so it is determined using the statistical *statifield random sampling*.

$((\text{the number of strata members in the population})/(\text{the total number of members of the population})) \times \text{number of samples}$

Class X A : = 6 student

Class X B : = 6 student

Class X C : = 6 student

Class X D : = 6 student

Class X E : = 7 student

Based on the data above, it can be seen the number of female students who obtained parental permission to take part in dysmenorrhea physical training, namely:

Table 1. Distribution of Young Women Who Get Parental Permission to Take Part in Dysmenorrhea Physical Training

No	Class	Students Give Receive Permission
1	X A	7
2	X B	9
3	X C	8
4	X D	8
5	X E	8
Total		40

Purposive sampling : The researchers re-screened 40 to 32 potential respondents for further sampling which was determined by the researchers with the consideration that the parents agreed to the young women being respondents to take part in physical exercise for dysmenorrhea with a duration of approximately 45 minutes 3 times in 1 week, experienced a history of menstrual pain in the previous month, when the intervention was carried out, they did not experience menstruation. Based on considerations, data was collected for a total of 32 respondents with a distribution of classes XA – XD with a total of 6 students and XE with a total of 7 students.

RESULTS

a. Characteristics

Table 2. Description Based on Respondent Characteristics

Variable	n	Mean	Median	Mode
Age	32	16	16	16

Based on table 1, it shows that from the characteristics of respondents the average age, the median value and the highest age is 16 years.

b. Pain level before and after treatment

Table 3. Description Based on Pain Levels Before and After Physical Exercise Treatment for Dysmenorrhea in Young Women

Variable	Treatment	Mean	Median	Mode	Min-Max
Pain level	before	6.88	7.00	8	5-9
	after	3.25	3.00	0	0-6

Based on the table, it can be seen that the pain level of respondents before treatment was an average of 6.88

with a median of 7, the highest pain was 8 with the lowest pain being 5 and the highest being 9. After treatment the average pain decreased to 3.25 with a median of 3, with pain as low as 0 and as high as 6.

c. Normality test

Table 4. Normality Test for the Incidence of Menstrual Pain Before and After Dysmenorrhea Physical Exercise

Variable	n	P Value
Before physical exercise dysmenorrhea	32	0,006
After physical exercise dysmenorrhea	32	0,027

In this study, the results of the normality test of the data before and after being given dysmenorrhea physical exercise showed that the data was not normally distributed with a P value before dysmenorrhea physical exercise of 0,006 and a P value after dysmenorrhea physical exercise of 0,027, meaning P value < 0,05, then bivariate analysis on This study used the Wilcoxon signed rank test to test the effect of dysmenorrhea physical exercise on the incidence of menstrual pain in young women at Senior High School 1 Gebog Kudus.

d. Comparison test results of average pain levels before and after dysmenorrhea physical exercise treatment

Table 5. Comparison the Average Level of Pain Before and After Dysmenorrhea Physical Exercise Treatment

Variable	Variable level pain post--pre				P
	Mean	difference mean pre -post	Median	difference median pre -post	
Before	6.88	3.63	7.00	4	0.000
After	3.25		3.00	0-6	

Based on the table above, it was found that the average level of pain before being given physical exercise treatment for dysmenorrhea was 6.88 and the average after treatment was 3.23. the average difference before and after is 3.63. The mean pain level before the physical exercise treatment for dysmenorrhea was 7 and after the treatment was 3.00. The difference in the mean pain level before and after was 4. Before physical

exercise, dysmenorrhea was given with the lowest pain level being 5 and the highest being 9.

After being given physical exercise for dysmenorrhea with the lowest pain level of 0 and the highest 6, P value of 0.000 was obtained. These data show that there is a statistically significant difference in the average level of pain before and after dysmenorrhea physical exercise treatment.

Based on the table above, it can be concluded that there is a significant difference between the average level of pain before and after physical exercise for dysmenorrhea. Based on the data, it can be concluded that there is a difference in the average level of pain between respondents before and after treatment, experiencing a decrease in pain level of 3.63. Thus, statistically it can be concluded that menstrual pain in young women can be controlled with dysmenorrhea physical exercise activities.

DISCUSSION

The respondents in this research were class X students at Senior High School 1 Gebog Kudus who experienced menstrual pain. Regarding the pain level before being given physical exercise for dysmenorrhea, the average history of menstrual pain experienced by respondents was 6.88, namely in the severe pain interval, the median value was 7.00 in the severe pain interval and the scale that often appeared was at 8. Before dysmenorrhea exercise was carried out the minimum value is in interval 5 and the maximum value is in interval 9.

Menstrual pain in adolescents is a common complaint, tends to be ignored, underdiagnosed and undertreated. It is characterized by complaints of painful cramps in the lower abdomen, which begin immediately after the onset of menstruation and can last for 3 days. In particular, menstrual pain has a negative impact on adolescents' quality of life (QOL) and is the main reason for school absence. Menstrual pain is physiologically influenced by increased intrauterine secretion of prostaglandins F2 α and E2. Prostaglandin levels are closely related to pain levels. Increased prostaglandin levels will increase myometrial muscle tension and uterine contractions. Furthermore, tension in the myometrium and uterine contractions will cause narrowing of the blood vessels so that blood flow to the uterus will decrease

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F2 α and E2. Prostaglandin levels are closely related to pain levels. Increased prostaglandin levels will increase myometrial muscle tension and uterine contractions. Furthermore, tension in the myometrium and uterine contractions will cause narrowing of the blood vessels so that blood flow to the uterus will decrease. It is very possible for this condition to progress to ischemia which can lower the uterine pain threshold, causing pelvic area pain, physical and psychological disorders. Physical disorders include headaches, lethargy, sleep disturbances, breast and whole body pain, appetite disturbances, nausea, vomiting, constipation or diarrhea and increased urination. Psychological symptoms include mood disorders such as anxiety, depression and irritability. Menstrual pain has an impact on reducing the quality of life, so pharmacological and non-pharmacological management is needed with the aim of improving the quality of life. One non-pharmacological treatment is through exercise or gymnastics (Yasar & Guneri, 2021). In previous research, it was known that menstrual pain can be reduced through physical exercise or dysmenorrhea exercises (Isa et al., 2017; Santi L.S, 2019).

The results of this research are in line with research that was carried out in 2020 showing that of the 14 respondents before the dysmenorrhea exercise, the majority experienced severe pain, 5 respondents (35.7%), 4 respondents (28.6%) experienced mild pain, 4 respondents (28.6%) experienced moderate pain and 1 respondent (7.1%) experienced very severe pain. It can be concluded that before being given dysmenorrhea exercises, the majority of respondents experienced severe pain (Santi L.S, 2019).

Menstrual pain occurs due to irregular contractions in the lining of the uterus or myometrium, causing one or more symptoms. Symptoms that arise are mild to severe pain in the lower abdomen, hips and muscle spasms on the medial side of the thigh. The pain appears some time before the first day of menstruation, then peaks after 24 hours and subsides after 2 days (Asrinah. Syarifah, J., 2011).

Menstrual pain in young women needs to be treated, even with self treatment or simple non pharmacological treatment to avoid anything more serious. The impact of menstrual pain also results in emotional conflict, tension and anxiety. This can interfere with teenagers' roles and cause discomfort. Adolescent girls who experience menstrual pain can interfere with teaching and learning activities. This makes it difficult for

young women to focus on studying because of the discomfort they feel when menstrual pain appears. Therefore, menstrual pain in teenagers needs to receive appropriate management to avoid further impacts (Sumiyati., Sakti, P. M., 2021).

The results of the study showed that after being given physical exercise for dysmenorrhea for 3 times, young women showed a decrease in menstrual pain, namely the average incidence of menstrual pain experienced by respondents was 3.25, namely in the mild pain interval, the median was 3.00 in the mild pain interval and the mode value was 0. After physical exercise for dysmenorrhea, the minimum value is 0 and the maximum value is 6.

This research is in line with previous research conducted by Hutagalung et al in 2022 on young women at SMA N 1 Sorkam Barat which showed a Wilcoxon signed rank test with a p value of <0.05, meaning that there was an effect of dysmenorrhea exercise on reducing menstrual pain. Data on the group of respondents after being given dysmenorrhea exercises showed a decrease in the degree of pain from 20 respondents who experienced moderate pain to 8 respondents (34.7%) and 15 respondents who experienced mild pain (65.3%)(Hutagalung, N., Susilo, T., & Vera, 2022).

The reduction in the incidence of menstrual pain can be influenced by regular exercise or exercise in the form of physical exercise for dysmenorrhea. Dysmenorrhea physical exercise is an exercise that stretches and strengthens the muscles, especially in the abdomen and lower back. Dysmenorrhea exercises can be done continuously 3 - 4 times a week before menstruation with a duration of 30 - 45 minutes. This exercise is specifically designed to increase muscle strength, endurance and flexibility, so it is hoped that it can reduce menstrual pain (Diati., 2011).

It is known that the average incidence of menstrual pain before and after physical exercise for dysmenorrhea is different. Before being given physical exercise for dysmenorrhea the average menstrual pain was 6.88, while after physical exercise the average dysmenorrhea was 3.25 resulting in an average decrease of 3.63. This shows that dysmenorrhea physical exercise is effective in controlling menstrual pain. proven by better results before physical exercise for dysmenorrhea. Based on the results of the Wilcoxon statistical test, the p value = 0.000 ($p < 0.05$). The conclusion that can be drawn from these results is that the management of physical

exercise for dysmenorrhea can control menstrual pain in young women at Senior High School 1 Gebog Kudus.

This research is in line with research on 15 teenage girls in Alam Jaya subdistrict, Tangerang city using a pre-experimental research design with a one group pretest posttest design. Giving dysmenorrhea exercise therapy to teenage girls who experienced menstrual pain for three days was able to reduce the intensity of menstrual pain from controlled weight by 11 people (73.3%) and moderate as many as four people (26.7%) to medium as many as 13 people (86.7%). The average decrease in pain intensity was from 6.73 to 4.67. There was a decrease in the average menstrual pain after being given dysmenorrhea exercises, namely from 6.73 to 4.74. These data show that there was a decrease in the range of menstrual pain felt by teenagers after being given dysmenorrhea exercise intervention. It can be concluded that dysmenorrhea exercise has an effect on reducing menstrual pain in young women in Alam Jaya Tangerang Village $P = 0.000$ ($p < 0.05$) (Astuti, Zayani, 2021).

One of the factors that influences dysmenorrhea is exercise. There is a correlation between exercise habits and dysmenorrhea. Light exercise training is recommended to reduce dysmenorrhea. Getting into the habit of exercising before and during menstruation can improve blood flow to the muscles around the uterus so that pain can be resolved or reduced. One relaxation technique that provides a comfortable and relaxed condition when experiencing menstrual pain is the movement of dysmenorrhea exercises (Darwis, M, A., & Syam, 2021).

The results of previous research stated that the respondents who experienced dysmenorrhea were late adolescents aged 18 - 21 years. The median value obtained before and after dysmenorrhea exercise decreased as indicated by a p-value = 0.00. This is because in late adolescence the function of the uterine nerves is optimized so that the secretion of prostaglandins increases, thus causing pain. (Nurjanah, I., Yuniza, Y., & Iswari, 2019).

Previous research which is in accordance with the results of this study regarding dysmenorrhea exercise in adolescents showed that out of 16 respondents, 10 people (62.5%) experienced dysmenorrhea. The level of dysmenorrhea in the group that was given treatment after exercise showed that the most dominant level of dysmenorrhea was mild pain, amounting to 6 people

(37.5%). The results of hypothesis testing using the dependent T test to test the level of dysmenorrhea before exercise and after exercise obtained a significance value of $0.000 < 0.05$, so H_0 was rejected. This significance value shows that there is a difference in the level of dysmenorrhea between before and after dysmenorrhea exercise (Isa et al., 2017).

Based on the results of research on 30 teenage girls consisting of control and treatment groups in Pati Regency, Central Java with a non-equivalent control group design, it is known that in the treatment group, the mean dysmenorrhea before doing dysmenorrhea exercises was 2.31, while the mean dysmenorrhea after doing dysmenorrhea exercises was 2.31. 1.07 and from these results it can be seen that there was a decrease in the level of dysmenorrhea after doing dysmenorrhea exercises. Based on the Wilcoxon test, a p value of 0.000 can be obtained, meaning $p < 0.05$, so H_0 is rejected. This shows that there is a difference in the level of dysmenorrhea before and after carrying out dysmenorrhea exercises on young women in Sidoharjo Village, Pati District (Marlinda, 2013).

Physical exercise or dysmenorrhea exercises is a recommended form of relaxation. The aim of doing physical exercise for dysmenorrhea is to reduce menstrual pain that some women experience every month. This is because when doing sports or gymnastics, the body will stimulate an increase in endorphin hormones. This hormone is produced by the brain and spinal cord. Endorphin hormones act as natural sedatives produced by the brain, causing a feeling of comfort (Ashriady *et al*, 2022).

Physical exercise for dysmenorrhea can be done continuously 3 - 4 times a week before menstruation with a duration of 30 - 45 minutes. This exercise is specifically designed to increase muscle strength, endurance and flexibility, so it is hoped that it can reduce menstrual pain. This exercise is easy to do independently or in groups with dysmenorrhea exercise movements consisting of warm-up movements, core movements and cooling movements (Diatl., 2011). Doing body exercises will produce higher endorphine hormones, which will reduce or eliminate the pain you feel so that you become more comfortable. By doing regular physical exercise, there will be an increase in the volume of blood flowing throughout the body, including the reproductive organs, thereby facilitating the supply of oxygen to the contracting blood vessels, thereby reducing menstrual pain (Afni *et al*, 2023).

The average difference in the decrease in the incidence of dysmenorrhea experienced by the 32 respondents in this study was that 11 respondents experienced a decrease of 3 with the calculated p value being 0.0036 with a significance of $0.000 < 0.05$, which means that menstrual pain can be controlled through physical exercise for dysmenorrhea. The results of this research are also in line with research on adolescent girls at Tapango Vocational School, Tapango District, Polewali Mandar Regency with the aim of the research to prove that there is an effect of dysmenorrhea exercise on reducing pain, showing that of the 15 respondents in the group who were given dysmenorrhea exercise and 15 respondents in the group who were not given dysmenorrhea exercise showed characteristics. for dysmenorrhea pain who were not given dysmenorrhea exercises, there were no respondents who experienced mild pain, 5 respondents experienced moderate pain and 10 respondents experienced severe pain. In the group of teenagers who were given dysmenorrhea exercises, 8 respondents had mild pain, 7 respondents had moderate pain and none experienced severe pain. From the research results, it is proven that there is an effect of giving and not giving dysmenorrhea exercises on reducing pain with a value of $P = 0.000$ which is less than the significance level $\alpha = 0.05$ so it can be said that doing dysmenorrhea exercises can reduce pain effectively (Nuraeni, 2017).

CONCLUSION

Characteristics of respondents with an average age of 16 years, a median of 16 years and a maximum age of 16 years

The pain level of respondents before treatment averaged 6.88 with a median of 7, the highest pain was 8 with the lowest pain being 5 and the highest being 9. After treatment the average pain decreased to 3.25 with a median of 3, with the highest pain the lowest is 0 and the highest is 6.

In this study, the results of the normality test of the data before and after being given physical exercise for dysmenorrhea used the Shapiro Wilk test because the sample used was < 50 , indicating that the data was not normally distributed with a P value before dysmenorrhea exercise of 0.006 and a P value after dysmenorrhea exercise of 0.027 meaning P value < 0.05 , then bivariate analysis in this study used the Wilcoxon signed rank test to test the effect of dysmenorrhea physical exercise on the incidence of menstrual pain in young women at Senior High

School 1 Gebog Kudus.

There is a significant difference between the average level of pain before and after physical exercise for dysmenorrhea. Based on the data, it can be concluded that there is a difference in the mean level of pain between respondents before and after treatment, experiencing a decrease in pain level of 3.63

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