



### Dysmenorrhea Exercise Affected The Level of Primary Menstrual Pain of Adolescents



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#### Abstract

Primary menstrual pain can affect productivity and so it needs to reduce the pain. The purpose of this study was to determine the effect of dysmenorrhea exercise on the level of primary menstrual pain of teenager at the Akhlaqul Karimah Orphanage, Malang City. The design of this study used One-Group Pre-Post Test Design. The population of this study was all teenager at the Akhlaqul Karimah Orphanage, Malang City amounted to 17 people. The sample was all teenager at the Akhlaqul Karimah Orphanage Malang City experienced primary menstrual pain and adjusted to the inclusion criteria with a total of 14 people with purposive sampling technique. The data collection technique used an instrument in the form of a menstrual pain level questionnaire using a numeric rating scale (NRS) (pretest and post-test). Analysis of the data used Marginal Homogeneity. The results showed that the average level of dysmenorrhea pain before the implementation of dysmenorrhea exercise showed that almost half 7 respondents (37.5%) had moderate pain levels, 12 respondents (75.0%) had mild pain level. The results of the analysis of the Marginal Homogeneity test showed that  $p$  value =  $(0.000) < (0.05)$  so that  $H_1$  was accepted, meaning that there was an effect of dysmenorrhea exercise and drinking water on the level of primary menstrual pain of teenager at the Akhlaqul Karimah Orphanage City. Health workers are expected to be able to provide health information about prevention and management of dysmenorrheal pain with dysmenorrhea exercise as a non-pharmacological method.

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## INTRODUCTION

The prevalence of dysmenorrhea in Indonesia is 64.25% consisting of 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea (Handayani, 2014). In East Java, the number of reproductive girls aged 10-24 years is 56,598 people, who experience dysmenorrhea and come to the obstetrics section of 11,565 people (1.31%) (BPS Province of East Java, 2010). In Surabaya, visitors who came to the midwife were 1.07–1.31% and of the number of visits to the obstetrics department were dysmenorrhea sufferers (Ningsih et al., 2013). The prevalence of dysmenorrhea among students or college students in Malang reached 58% and 20% reported being unable to attend lectures (Nurhidayati, et al, 2006).

Primary dysmenorrhea can be treated in 2 ways, namely by pharmacological and non-pharmacological methods. With pharmacological methods, pain is overcome by administering analgesic drugs, hormonal therapy, nonsteroidal prostaglandin drugs, and cervical canal dilatation (Novadela et al., 2019). While non-pharmacological therapies include warm compresses, exercise, Mozart therapy, and relaxation (Marlinda, 2013). Dysmenorrhea can be overcome through non-pharmacological methods of exercise. Exercise is an effective way and increases blood flow to the reproductive organs and improves overall health to maintain regular menstrual cycles if exercise is done 30-60 minutes every 3-5 times a week. Sports that can be done such as swimming, walking, jogging, gymnastics and cycling (Murtiningsih et al., 2018). Sports that can be used to reduce menstrual pain are easy and practical, gymnastics (Sari et al., 2017). When doing dysmenorrhea exercise, the spinal cord will produce endorphins which function as natural sedatives and cause a sense of comfort (Solihatunisa, 2012). Dysmenorrhea exercise can help improve blood flow to the muscles around the uterus so that pain can be reduced or overcome. Dysmenorrhea gymnastic movements consist of warm-up

movements, core movements and cooling down (Lina & Kumalasari, 2020). This is supported by research conducted by Marlinda (2013) which states that there is an effect of dysmenorrhea exercise on decreasing dysmenorrhea in adolescent girls in Sidoharjo Village, Pati District by doing exercise in the third week after the last menstruation.

## METHOD

The population used in this study were all young women who experienced primary dysmenorrhea at the Akhlaqul Karimah Orphanage, Malang City, as many as 17 people. The number of samples studied in this study were 14 young women who experienced primary dysmenorrhea. The sampling technique in this study uses purposive sampling technique where purposive sampling is based on certain considerations made by the researcher. The inclusion criteria of this study are: a) Young women who are in the Akhlaqul Karimah Orphanage, Malang City, b) Teenager with primary dysmenorrhea, c) Teenager who are willing to be respondents.

The study was carried out at the Akhlaqul Karimah Orphanage, Malang City, where the time of the study was carried out in April - June 2021. The independent variables in this study were dysmenorrhea exercise. The dependent variable in this study is the level of menstrual pain (primary dysmenorrhea). Measurement of the intensity of menstrual pain using the Numeric Rating Scale (NRS). This study used the marginal homogeneity test, which is a test that is carried out if the data collected from two samples that influence each other where one sample will have two data.

This design is most commonly known as the pre post design, meaning that it compares the average pre-test score and the post-test average value. Marginal Homogeneity Test is a test that is used to test the effect of treatment using questionnaire data before and after the decision making of the Marginal Homogeneity Test.

## RESULTS

**Table 1: Distribution of Frequency Based on Characteristics of Respondents about The Effect of Dysmenorrhea Exercise on Pain Levels in Adolescents at Akhlaqul Karimah Orphanage Malang city**

Variables	Category	Frequency	Percent (%)
Age	14-15 years	3	21,4
	16-17 years	6	42,9
	18-18 years	5	35,7
Dysmenorrhea experience	Yes	14	100,0
	No	0	0,0
Dysmenorrhea's effect	Study activity disturbed	7	50,0
	Physic activity disturbed	5	35,7
	No effect	2	14,3
Pain treatment	Yes	9	64,3
	No	5	35,7
Menarche	9-11 years	3	21,4
	12-13 years	11	78,6
<b>Total</b>		<b>14</b>	<b>100</b>

Source: Primary Data

Based on table 1 show the result there is almost a half 6 respondents (42,9%) in 16-17 years age. Based on Table 1 shows almost half of 6 respondents (42.9%) aged 16-17 years, all 14 respondents (100%) had experience of dysmenorrhea, half of them 7 respondents (50.0%) impact dysmenorrhea is a disturbed learning activity, mostly 9 respondents (64.3%) took pain management measures and almost all 11 respondents (78.6%) the age of menarche is 12-13 years.

The results of the study on the level of primary menstrual pain in adolescents at the Akhlaqul Karimah Orphanage, Malang City before being given dysmenorrhea exercise are presented in the following table.

**Table 2: Frequency Distribution of Pain Levels in Adolescents in The Akhlaqul Karimah Orphanages in Malang City Before Giving Dysmenorrhea Exercise.**

Pain level	Frequency	Percent (%)
No pain	0	0
Mild	4	28,6
Moderate	5	35,7
Severe	5	35,7
<b>Total</b>	<b>14</b>	<b>100</b>

Based on Table 2 shows that almost half of 5 respondents (35.7%) had moderate and severe levels of pain before being given dysmenorrhea exercise. The results of the study on the level of primary menstrual pain in young women at the Akhlaqul Karimah Orphanage, Malang City after being given dysmenorrhea exercise, are presented in the following table:

**Table 3: Frequency Distribution of Pain Levels in adolescents in Akhlaqul Karimah Orphanages Malang City After Giving Dysmenorrhea Exercise**

Pain level	Frequency	Percent (%)
No pain	3	21,4
Mild	10	71,4
Moderate	1	7,1
Severe	0	0
<b>Total</b>	<b>14</b>	<b>100</b>

Based on Table 3 shows that most of the 10 respondents (71.4%) had a mild level of pain after being given dysmenorrhea exercise. This study uses the Marginal Homogeneity test to determine the effect of dysmenorrhea exercise on the level of primary menstrual pain in adolescent at the Akhlaqul Karimah Orphanage Kota Malang,

data decision making seen from the level of significance ( $\alpha$ ) less of 0.05, with the presentation of the data as follows.

**Table 4: Analysis of the Effects of Dysmenorrhea Exercise on The Pain Levels in Adolescents at Akhlaqul Orphanage Karimah Malang City.**

Pain level		After						Total		p
		No pain		Mild		Moderate		f	%	
		f	%	f	%	f	%			
Before	Mild	3	21,4	1	7,1	0	0	4	28,6	0,001
	Moderate	0	0	5	35,7	0	0	5	35,7	
	Severe	0	0	4	28,6	1	7,1	5	35,7	
<b>Total</b>		<b>3</b>	<b>21,4</b>	<b>10</b>	<b>71,4</b>	<b>1</b>	<b>7,1</b>	<b>7,1</b>	<b>100</b>	

Based on table 4, the results of the analysis of the Marginal Homogeneity test are obtained p value = (0.001) < (0.05) so that H1 is accepted, meaning that there is an influence of gymnastics exercise on pain levels in adolescent in Akhlaqul Karimah Orphanage, Malang City. Cross tabulation results obtained of 5 respondents (35.7%) who had moderate and severe pain levels before given dysmenorrhea exercise has moderate pain level experienced a decrease in the level of pain to be mild by 5 and 4 respondents (35.7% and 28.6%) after being given dysmenorrhea exercise. This proves that giving dysmenorrhea exercise and drinking water able to reduce pain levels in adolescent.

## DISCUSSION

### *Primary Menstrual Pain Level in Adolescents Before Dysmenorrhea Exercise*

Based on Table 2 shows that almost half of 5 respondents (35.7%) had moderate and severe levels of pain before being given dysmenorrhea exercise. Based on the characteristics of the respondents the age of adolescent girls who experience dysmenorrhea shows almost half 6 respondents (42.9%) aged 16-17 years. According to Junizar (2011) dysmenorrhea generally occurs at the age of 15-30 years and often occurs at the age of 15-25 years. This can happen because at the age of adolescence there is an optimization of function uterine nerves so that the secretion of prostaglandins increases which eventually pain during menstruation or dysmenorrhea (Novia and Puspita, 2008).

All respondents (100%) totaling 14 people have dysmenorrhea experience. The experience of dysmenorrhea can affect the response individual to pain, the more often the experience of pain is felt, the more the better a person will respond to his pain (Suban et al 2017). The experience of dysmenorrhea experienced by each teenager is different because pain is a subjective feeling that is sometimes difficult to find symptoms objective (Hartati, et al 2012). Experiential exploration is necessary because This experience can be used as a benchmark or guideline for adolescents in doing activities and respond to everything in the future (Qomariyah, 2016).

Based on the characteristics of the respondents the actions taken to dealing with dysmenorrhea pain, 9 respondents (56.3%) did the treatment of dysmenorrheal pain while 7 respondents (43.8%) did not perform pain relief. From the results of the study, it was also found that respondents only just let the dysmenorrhea pain go away on its own. Efforts to treat dysmenorrhea are not necessarily all actions taken by the doctor adolescents, besides the efforts that have been made by adolescents are still not optimal and there are still many teenagers who tend to let the pain of dysmenorrhea without handled. This problem is caused by lack of knowledge about the management of dysmenorrhea (Lestari et al, 2010). Dysmenorrhea should not be left unattended without treatment, because there could be g symptoms of endometriosis that make it difficult for women to get pregnant. Handling proper dysmenorrhea can reduce the risk of endometriosis, disruption of work and study activities (Prawirohardjo, 2009).

Based on the characteristics of the respondents the impact of primary menstrual pain in adolescent girls, half of them are 7 respondents (50.0%) the impact the dysmenorrhea is disrupted learning activities, 5 respondents (35%) Physical activity was disturbed and 2 respondents (14.3%) were not affected. This means primary Menstrual pain which often occurs in adolescents can interfere with adolescent girls to be able to carry out normal activities. Many adolescents who experience disturbances in learning activities caused by primary

dysmenorrhea pain felt difficulty concentrating due to the discomfort felt when menstrual pain (Mulyati & Sasnitiari, 2019). Not only impact on academic performance, primary dysmenorrhea also has a significant impact to discomfort in carrying out daily physical activities.

This complaint relates to repeated absences from school or at school workplace, which can interfere with productivity. From 40%-70% women during the reproductive period experienced menstrual pain, and 10% experienced it to interfere with daily activities. About 70-90% of cases of menstrual pain occur when they are teenagers and teenagers who experience menstrual pain will be affected by their activities academic, social and sports (Puji, 2009). The results of this study are supported by research conducted by Fitri & Ariesethi (2020) on the effect of dysmenorrhea on student learning activities in the D111 Study Program Obstetrics, the results of the study found that there was an effect of dysmenorrhea on the learning activities of the DIII Midwifery Study Program students, this is shown by 40 female students (33.9%) with dysmenorrhea, as much as 87.5% have learning activity disorders.

Based on the results of study from 14 respondents, almost all 11 respondents (78.6%) age at menarche is 12-13 years, while 3 respondents (21.4%) the age of the manager is 9-11 years. The first menstruation or menarche experienced by women of childbearing age (WUS) is an early sign of entry a woman in her reproductive years. The longest age to get menarche is 16 years old, the age at menarche is uncertain or varies, however There is a tendency that from year to year adolescent women get menstruation first at a younger age. Early menarche is menstruation experienced by a fertile woman at the age of under 12 years (Savitri et al, 2019).

In this study, there were also many respondents with normal menarche age with primary dysmenorrhea. This is because the nutritional intake different in adolescents. Adolescents with good nutritional intake will age menarche will be fast. On the other hand, if one has a lifestyle that is not healthy (smoking or never exercising) then pain during menstruation will increasing (Huda & Ningtyas, 2020).

### ***The Level of Primary Menstrual Pain in Adolescent Girls After Dysmenorrhea Exercise***

Based on table 4 after dysmenorrhea exercise and drinking water shows that almost all respondents are mostly 10 respondents (71.4%) had a mild level of pain and there were no more respondents who had experience severe pain. The decrease in the level of dysmenorrhea pain is influenced by: dysmenorrhea and drinking water. This is supported by research that conducted by Puji (2009) on the effectiveness of dysmenorrhea exercise in reduce dysmenorrhea in adolescent girls at SMU N 5 Semarang shows that before being given dysmenorrhea exercise, most respondents had pain moderate dysmenorrhea amounted to 8 respondents (53%). After doing dysmenorrhea exercise the most respondents with mild dysmenorrhea pain amounted to 11 respondents (73.3%). And also, research conducted by Suban (2017) about the effect of water therapy on the reduction of primary dysmenorrhea in Young women at Kos Bambu, Tlogomas Village, Malang City show before being given water therapy, almost half of the respondents with moderate dysmenorrheal pain amounted to 7 respondents (41%). After being given therapy water, almost half of the respondents experienced a decrease in pain mild dysmenorrhea amounted to 7 respondents (41%).

Dysmenorrhea exercise is a relaxation technique. Dysmenorrhea exercise can produce endorphins. Endorphins are neuropeptide produced by the body when relaxed or calm. Endorphins produced in the brain and spinal cord. This hormone can serve as a natural sedative produced by the brain that gives birth to feelings comfortable and increase the levels of endorphins in the body to reduce feeling pain during contraction. Dysmenorrhea exercise has been shown to increase levels of b-endorphins four to five times in the blood. So, the more doing exercise, the higher the levels of b-endorphins. When someone does dysmenorrhea exercise, then b-endorphins will come out and captured by receptors in the hypothalamus and functioning limbic system to regulate emotions. Increased b-endorphins have been shown to be closely related with reduced pain, improved memory, improved appetite, sexual ability, blood pressure and respiration (Harry, 2007). so that dysmenorrhea exercises will be effective in reducing pain problems, especially pain dysmenorrhea.

### ***The Effect of Dysmenorrhea Exercise on Levels of Menstrual Pain (Primary Dysmenorrhea) in Adolescent Girls***

To determine the effect of dysmenorrhea exercise on the level of primary menstrual pain, researchers used the test marginal homogeneity for dysmenorrhea pain level after exercise. Respondents who experienced a decrease in pain level with p-value (asympt.sig. 2-tailed) of  $0.001 < 0.05$  this means that H1 is accepted. H1 accepted This means that there is a significant effect before and after dysmenorrhea exercise on the level of primary menstrual pain in adolescent at the Akhlaql Karimah Orphanage, Malang City.

This happens considering that pain is a subjective thing and only someone who has experienced this condition can describe it the amount of pain felt. So it will have an effect on decreasing score of pain level in each respondent (Siahaan, 2012). Solehati and Kosasih (2015) argues that pain can occur because of a stimulus Pain that includes physical (internal, mechanical, electrical) and chemical. If there are damage to the network due to the continuity of the disconnected network then histamine, bradykinin, serotonin and prostaglandins will be produced by the body. These chemicals will cause pain. Anurogo and Wulandari (2011) states that during menstruation the exfoliated endometrial cells release prostaglandins. These prostaglandins cause the endometrial muscles to contracts and causes blood vessels to constrict (vasoconstriction) surrounding. This narrowing prevents the delivery of oxygen to the tissues endometrial tissue, resulting in a lack of oxygen (ischemia) and cause pain (Sukarni & Wahyu, 2013).

The results of this study are supported by research conducted by Nurjanah et al (2019) on Stikes Dormitory Students Muhammadiyah Palembang frequency before exercise dysmenorrhea pain scale the median value of menstruation is 5.00 with a minimum value of 2 and a maximum of 9. Results interval estimation with 95% confidence level lower menstrual pain scale 4.27 and 5.56 uppers. While the median value after exercise dysmenorrhea 0.00 with a minimum menstrual pain scale of 0 and a maximum of 4. And the estimation results interval with 95% confidence level lower menstrual pain scale 0.39 and upper 1.08. With the median value before and after dysmenorrhea exercise decreased which was indicated by the p-value = 0.00. And also, research conducted by Indriastuti (2008) on adolescent girls in Panti Nurul

Huda Az-Zuhdi's care, Meteseh Village, shows before therapy water, respondents with moderate pain are the largest number, namely 45,455. After being given water, the characteristic painless has a total of the most by 59.1%. Run-Test analysis proves that water therapy associated with a decrease in the dysmenorrheal pain scale with a p value of 0.05.

According to Marwoto (2008) gymnastics is a body exercise that is selected and created with a plan. Arranged systematically with the aim form and develop a harmonious personality. The results of this study according to the theory of Harry (2007) which states that dysmenorrhea gymnastics is a relaxation technique that can produce hormones endorphins.

Endorphins are neuropeptides that the body produces when relaxed or calm down. Endorphins are produced in the brain and spinal cord. This hormone can function as a natural sedative produced by the brain which gives birth to a sense of comfort and increases the levels of endorphins in the body to reduce pain during contractions. Proven dysmenorrhea exercise can increase the levels of b-endorphins four to five times in the blood. So, the more you do dysmenorrhea exercise, the more high levels of b-endorphins. When a person does dysmenorrhea exercise, then b-endorphins will come out and be captured by receptors in the hypothalamus and the limbic system, which regulates emotions.

Based on the results of the study showed that before dysmenorrhea exercise, almost half of the respondents' experience pain moderate 7 respondents (37.5%), after dysmenorrhea exercise. The respondent experienced a decrease in the level of pain to mild pain with changes in scores or different numbers, while 5 respondents who experienced severe pain also experienced a decrease in 4 respondents including: experienced a decrease in the level of pain to mild pain and 1 other respondent to moderate pain. This is in accordance with the researcher's observation that respondents did dysmenorrhea exercise and drank water well and regularly according to the schedule it will have the effect of decreasing the level of pain real.

### **CONCLUSION**

Conclusions that can be drawn based on the results of study on the effect of dysmenorrhea exercise on the level of primary menstrual pain in adolescent at the Akhlaql Karimah Orphanage Kota Malang, these are:

1. The average level of dysmenorrheal pain before the implementation of dysmenorrhea

- exercise shows that almost half of the 5 respondents (35.7%) had moderate pain level
- The average level of dysmenorrheal pain after the implementation of dysmenorrhea exercise shows that most of the 10 respondents (71.4%) had mild pain level
  - The results of the analysis of the Marginal Homogeneity test obtained  $p$  value =  $(0.001) < (0.05)$  so that  $H_1$  is accepted, meaning that there is an influence of dysmenorrhea exercise on the level of primary menstrual pain in adolescents at the Akhlaqul Karimah Orphanage, Malang City

### SUGGESTION

Health workers are expected to be able to provide health information about prevention and management of dysmenorrheal pain, namely in the form of: non-pharmacological management, namely dysmenorrhea. Also, it is expected to apply dysmenorrhea exercise as a non-pharmacological method to treat menstrual primary pain.

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### CONFLICTS OF INTEREST

This community project is part of roadmap community service plan of the Department of Maternal, Faculty of Health Science, Tribhuwana Tungadewi University. We explained and collected data from participants on behalf of The Research Team of the Department of Maternal, Faculty of Health Science that had not any relationship to participants to avoid conflicts of interest.

### AUTHOR CONTRIBUTIONS

The main researcher plays a role in preparing proposals and final report. Other researchers play a role in collecting data, data analysis, preparation of study results, reporting results and assisting the main researcher in preparing community service.

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