

The Effects of Anti Dysmenorrhea Gymnastics on Reducing Menstrual Pain in Adolescent Girls

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Abstract: Dysmenorrhea is a physical disorder in women who are menstruating in the form of pain / cramps in the lower abdominal area radiating to the back. This matter disturbs the life activities that experience it, especially learning activities in adolescents. Gymnastics is a relaxation technique that can reduce pain because the brain and spinal cord structure will produce endorphins, which function as natural sedatives that cause a sense of comfort. This study identified the effect of dysmenorrhea gymnastics on decreasing menstrual pain. This research type was quasi-experimental design with one group pretest-posttest design. Sampling was purposive sampling; with the Slovin formula obtained sample of 23 people, data collection tools used observation sheets, NRS sheets to measure pain scale. Data were analyzed with Wilcoxon test. The results showed that there were significant differences before and after gymnastic dysmenorrhea towards decreasing menstrual pain, P value = 0.001. This means that there is an effect of dysmenorrhea gymnastic on decreasing menstrual pain in adolescent girls. It is recommended that dysmenorrhea gymnastic be used as an alternative intervention to reduce menstrual pain and as a non-pharmacological method.

1 INTRODUCTION

Adolescence is a period of individual development that changes from childhood to adulthood and shows an individual's psychological maturation, it usually occurring at the age of 13-20 years (Enny Purwaningsih, 2016). According to WHO, adolescents are in the age range of 10-19 years. During adolescence there are hormonal, physical, psychological and social changes. Where the condition is interpreted as puberty. One sign of puberty in young women is menstruation (Indah Juliana, 2019). The first menstruation or menarche, at the beginning of the age of menarche is usually prone to menstrual problems or disorders. In the last 100 years the age of menarche has shifted to a younger age, the average age of menarche now ranges between 11-13 years due to improved general health and nutrition (Fitrientyas et al, 2017). Menstrual pain is a gynecological complaint due to imbalance of the progesterone hormone in the blood which causes pain. Women who experience dysmenorrhoea produce prostaglandins 10 times more than women who do not dysmenorrhoea. Prostaglandins cause increased uterine contractions, and at excessive levels

will activate the large intestine. Other causes of dysmenorrhea are experienced by women with certain disorders, such as endometriosis, pelvic infections (pelvic area), uterine tumors, appendicitis, digestive organ disorders, even kidney disorders (Nyna puspita, 2017). Pain occurs due to an overproduction of prostaglandins resulting in excessive myometrial contractions and arterial vasoconstriction resulting in painful cramping in the lower abdomen (S Saleh H, etal 2016). Based on data from the World Health Organization (WHO), an incidence of 1,769,425 people (90%) of women experience menstrual pain, 10-15% of them have severe dysmenorrhoea (Nurwana, 2017). According to CNN (2015) 72 percent of Indonesian women experience female problems, and 62 percent of them are menstrual pain. The incidence (prevalence) of menstrual pain among women of childbearing age ranges from 45-95%. Although dysmenorrhea is generally not dangerous, it is often felt disturbing for women who experience it. The symptoms that are often caused during menstruation are discomfort caused because during menstruation the volume of water in our body decreases. Other symptoms felt are headaches, aches in the legs and waist for several

hours, stomach cramps and abdominal pain (Erny Puaningsih, 2016).

Menstrual pain can disrupt life quality (Saudi Arabia Profile, 2014). The negative impact can disrupt the concentration of learning due to pain so that academic youth decreases due to the absence of adolescents during the learning process (M. Nadjib Bustan et al, 2018).

Dysmenorrhea can be reduced pharmacologically and non pharmacologically. Pharmacologically with Non Steroidal Anti-Inflammatory Drugs (NSAIDs) such as Ibuprofen, Naproxen, Diclofenac, Hydrocodone, Ketoprofen and acetaminofene. But these drugs can cause dependence and have contra indications, namely hypersensitivity, peptic ulcers, bleeding, gastrointestinal perforation, renal insufficiency, and a high risk of bleeding. While non-pharmacological ways can be done with relaxation, hypnotherapy, warm water compresses, sports or gymnastics, distraction by diverting attention by reading and watching television or listening to the radio (Desti, 2015).

Regular exercise and physical activity can reduce menstrual pain because exercise affects steroid hormones (Devika Bhide et al, 2017).

Exercise is a natural way to reduce stress levels and menstrual cramps (Reda Mohamed et al, 2016). Yoga and physiotherapy exercises also help reduce pain immediately in primary dysmenorrhea (Padmaja Guruprasad et al, 2019). Light exercise is recommended to reduce dysmenorrhea. Sports / gymnastics is one of the relaxation techniques that can reduce pain. This is caused when doing sports / gymnastics the body will produce endorphins. Endorphins are produced by the brain and spinal cord. This hormone can function as a natural sedative in the production of the brain, causing a sense of comfort (Yuyun, 2017). Gymnastics performed are anti-dysmenorrhea exercises to reduce menstrual pain (Miladiyah, 2016). Data shows that 70 - 97% of adolescent girls experienced pain due to menstrual pain (Reda Mohamed-Nabil Aboushady et al, 2017). Narges Motahari-Tabari (2017) concluded that gymnastic dysmenorrhea is as effective as consuming Mefenamic Acid as a reliever of menstrual pain consumed by adolescents girls. Hend S Saleh (2016) compared physical stretching and core strengthening exercises to deal with primary dysmenorrhea, where the intensity and duration of pain were significantly reduced but there was no difference. Home-Based Stretching Exercises and Menstrual Care performed by adolescent girls in reducing menstrual pain showed significant results around 37.5% pain reduced after gymnastics (Reda Mohamed et al, 2016).

In this case, researchers concluded that previous studies that have been carried out partly showed significant results between dysmenorrhea exercises performed with decreased menstrual pain. Several studies have compared dysmenorrhea exercise with anti-pain medications. The results obtained, administration of anti-pain medication is more effective but it has side effects on health. Exercise is done before with short duration so it is less effective in reducing pain. In this study we propose dysmenorrhea exercises with a different duration from previous studies.

2 RESEARCH METHOD

This research was conducted at SMK Madani Patumbak Sub District Deli Serdang Regency. This research used quasi experimental method. The research design used One Group Pre Test - Post Test pre-experimental design. This design involved a group that is given a pre-test (O), given treatment (X) and given a post-test. Its success is determined by comparing pre-test and post-test scores.

The first step determined the sample that be used as a research sample and made them in group into one research class. The next step gave a pre-test to assess the pain level before gave gymnastics. Then the final stage of the sample gave a post-test to assess the level of pain after being given anti-dysmenorrhea exercises. The population were adolescent girls who experienced dysmenorrhea as many as 30 people; sampling by purposive sampling used slovin formula obtained sample of 23 people. The research instrument used observation sheets, questionnaires and Numerical Rating Scale (NRS). NRS to measure the pain level by mentioning the pain scale range of 0-10. Scale 0 is said to be painless, scale 1-3 was mild pain, scale 4-6 was moderate pain, scale 7-9 was severe pain, and scale 10 was very severe pain. Test data normality used with Shapirowilk because the sample were <30 people. The results of normality test data were normally distributed data then the data analysis used paired samples T-test, but if it was not normally distributed then used the Wilcoxon test by using the SPSS 25 computer programs. Dysmenorrhea gymnastics is carried out for 15-30 minutes and each movement is counted for 5-10 seconds or 2 resets on 10 counts.

The research procedure was carried out with the preparation stage of research design, literature study, making media and instruments and then validated the media and research instruments after that carried out the research by assessing the pain level before

gymnastics then providing anti- dysmenorrhea gymnastic treatment, reassessing pain and processing data and analyzed. After the data analysis process was complete, see the extent to which pain is reduced.

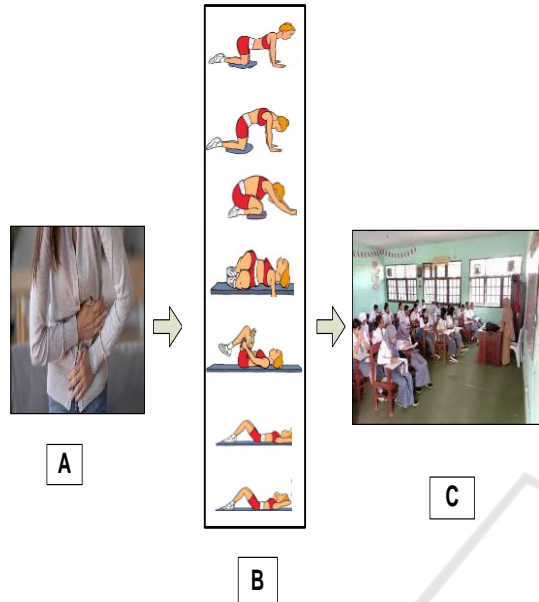


Figure 1: describes a teenager experiencing pain during menstruation (A), than gymnastics for anti-dysmenorrhea (B), and the laste explains that young women can carry out activities as usual, take part in school activities without feeling menstrual pain anymore (C).

3 RESEARCH RESULTS

3.1 Respondent Characteristic

Characteristics of the respondent’s age were 15- 17 years old, the majority were 16 people who have aged 16 years old (60.9%) and the age of menarche was 12-15 years old, the majority were 13 years old as many as 13 respondents (56.5%).

3.2 Univariate Analysis

Univariate analysis aimed to explain or describe each research variable (Notoadmojo, 2017).

3.2.1. Frequency Distribution of Respondents Based on Pain Scale Before and After Dysmenorrhea Gymnastics

Based on the graph it can be seen that the pain level respondents before doing dysmenorrhoea gymnastics

mostly moderate pain scale as many as 19 people (82.6%), while the pain level after doing gymnastics dysmenorrhea the majority of respondents had mild pain scale as many as 14 people (60.9%).

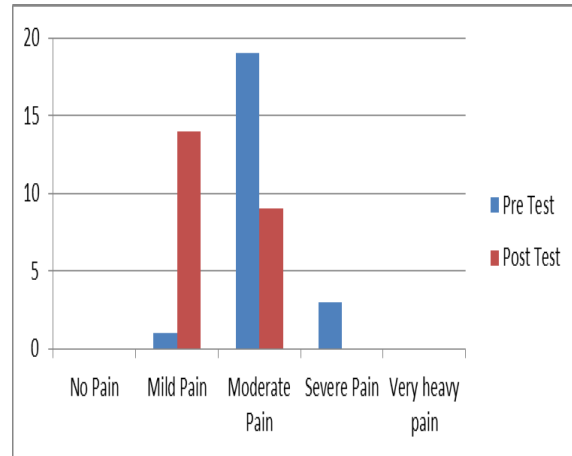


Figure 2: Frequency Distribution of Respondents Based on Pain Scale Before and After Dysmenorrhea Gymnastics.

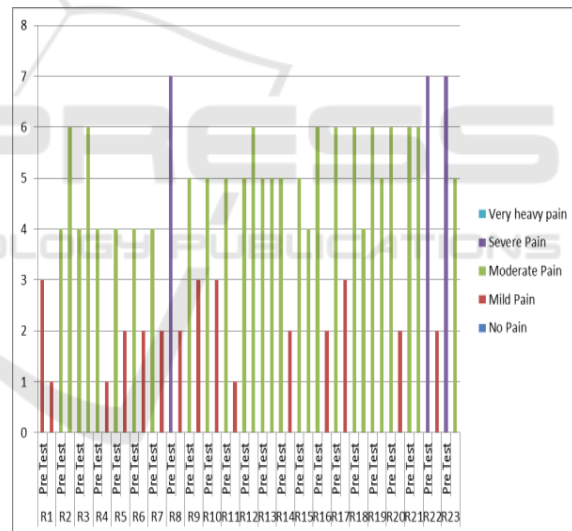


Figure 3: Frequency Distribution of each Respondent Based on Pain Scale before and after Exercise Dysmenorrhea.

3.3 Bivariate Analysis

Bivariate analysis is a test of two variables that are thought to be related or correlated. This study used bivariate analysis to see the effect of dysmenorrhea gymnastic in reducing menstrual pain in adolescent girls. The statistical test used the dependent T-test (independent T-test) if the data were normally distributed but if the data were not normally distributed using Wilcoxon.

3.3.1. Data Normality Test Before and After Dysmenorrhea Gymnastics

Based on table 1 the normality test was not normally distributed where the significance value before gymnastics was 0.062 while the significance value after gymnastics was 0.006 then the significance value was $P < 0.05$ so that it could not carry out the dependent T-test.

Table 1: Data Normality Test Before and After Dysmenorrhea Gymnastic.

	Shapiro-Wilk		
	Statistic	Df	Sig
Before Gymnastic	.918	23	.062
After Gymnastic	.868	23	.006

3.3.2. Difference in Mean Values of Respondents Based on Pain Scale Before, After and Effect of Dysmenorrhea Gymnastics

From the results of statistical tests performed menstruation pain levels before dysmenorrhea exercise is the highest scale 7 (Severe Pain) and the lowest scale 3 (Mild Pain) with a standard deviation of 1.114. At the time of dysmenorrhea exercise, it is found that the level of menstrual pain after dysmenorrhea is the highest scale 6 (moderate pain) and the lowest scale 1 (mild pain) with a standard deviation of 1.764 and from the Wilcoxon statistical test p value of 0.001, it can be concluded that there were differences significant between the level of menstrual pain in adolescents before and after exercise dysmenorrhea.

Table 2: Average Value of Respondents Based on Pain Scale before and after also the Effects of Dysmenorrhea Gymnastics.

Variable Menstrual	Mean	Pain Scale	SD	SE	Sig(2-taile)	N
Before						
Dismenorrhea Gymnastic	5.17	3-7	1.11	.232	0.001	23
After						
Dismenorrhea Gymnastic	3.26	1-6	1.76	.368		

4 DISCUSSION

4.1. Respondents Characteristics by Age of Menarche and Age

This study showed that the majority of respondents aged 16 years were 14 people (60.9%). This is consistent with previous research which is conducted by Luh Nyoman Mas Amita, dkk (2018) showed showed that of 131 respondents, most of the cases of dysmenorrhea occurred at the age of menarche 12-13 years (56.5%), had a family history (58.8%), 3-7 days menstrual period (92.4%), and experienced mild degree of pain (57.3%). The most accompanying symptoms were lower abdominal pain (94.7%). Other research by Raheela Kanwal (2017) in Turkey showed that there was difference in pain scale between the age of 20 years menarche at the age of 13 years with the age of 18 years menarche 11 years. Eugenia Vlachou (2019) in Greece, early menarche is one of the factors that influence menstrual pain from cross sectional test obtained $P > 0.05$.

According to Ortiz (Hend Saleh, 2016) shows that the average age of respondents who experience dysmenorrhea is 17-35 years old. Primary dysmenorrhea generally begins 1-3 years old after the first menstruation (menarche). This study is in line with the theory (Sylvia, 2016) said that menstrual pain in adolescents due to excessive prostaglandin hormone that increases the amplitude and frequency of uterine contractions that cause pain. Dysmenorrhea generally occurs in the first year of menstruation, the age range of menstrual pain often occurs at the age of 12-17 years old, and reaches a maximum limit at the age of 15-25 years old. One of the risk factors for dysmenorrhea is in people who experience menarche earlier.

According to the researchers' assumption that age with menarche age is one of the factors of menstrual pain because menstrual pain will appear when at the beginning of menstruation and will disappear with adulthood and it can be seen that the average pain scale before dysmenorrhea exercise is moderate pain, this can be caused by stress factors and no effort in dealing with menstrual pain such as gymnastics.

4.2. Menstrual Pain Before and After Dysmenorrhea Gymnastic in Adolescent Girls

Menstrual pain is pain in the abdominal area caused by strong uterine muscle contractions on the first and second days of menstruation and it can interfere with

activity (Miladiyah, 2016). According to Mike Armou et al (2019), the most common symptom of dysmenorrhea is colic cramps under the abdomen, occurring within 8-72 hours of menstruation, and usually peaking within the first few days of menstruation. Menstrual pain in adolescents due to excessive prostaglandin hormone causes strong uterine contractions so that dysmenorrhea pain generally occurs in the first year of menstruation. Dysmenorrhea is a stretching exercise especially on the abdomen for 30 minutes. These exercises are designed to increase muscle strength, endurance and muscle flexibility, so that it is expected to reduce menstrual pain or dysmenorrhea.

Based on the study, menstrual pain before did dysmenorrheal gymnastic, it is experienced menstrual pain on a scale of 5 (moderate pain) totaling 19 respondents and after did gymnastics, it had decreased menstrual pain with pain scale 2 (mild pain) totaling 14 respondents (60.9%). This is consistent with previous research, namely Novia and Puspitasari research (2018) showed that primary dysmenorrhea is more common in the age range of 15-25 years old with percentage of 87% in the number of respondents 100 people. Another study by Ortiz (2010) in Mexico showed that the average age of respondents experiencing dysmenorrhea was 17-35 years old. Primary dysmenorrhea generally begins 1-3 years old after the first menstruation (menarche). This research is in line with the theory (Sylvia, 2016).

Dysmenorrhea gymnastic can reduce pain, when doing gymnastics, the brain and spinal cord produce endorphins which function as natural sedatives that cause a sense of comfort. The more often you do gymnastics, the higher levels of β endorphine that will come out and be captured by the receptors in the hypothalamus and limbic system that function as regulators of emotions. It does not only produce endorphins but it can also increase abdominal muscle strength, abdominal flexibility, endurance, tension relief and can relax breathing and improve lung ventilation so that oxygen in the blood increases and can reduce pain scale. This is consistent with previous research, namely SP Rajalanshami research (2019) in India, showed that there was a significant decrease in pain scale after dysmenorrhea gymnastics. Venna Kirthika's research (2019) also concluded that there were significant differences between the exercise control group where $P < 0.05$. Research conducted by Devika Bhide (2017) also stated that there were significant changes between pre and post pain scales where $P > 0.05$. Elia Fernandez's research (2019) which obtained results from 2 data groups, namely 90.5% analgesic group and 80%

gymnastic group and concluded that dysmenorrhea gymnastics was more effective than pharmacological treatment.

According to researchers, dysmenorrhea gymnastics greatly affect menstrual pain because the movements made during dysmenorrhea can stretch the hips and waist and stimulate the hypothalamus in producing hormones, maintain hormonal balance that makes sense so that teens who experience pain feel relaxed and the pain scale is felt to be reduced. It makes that this exercise is more in demand by teenagers in reducing pain experienced during menstruation if it is compared to taking pain relievers that provide side effects let alone consumed in a prolonged time. Different from the results of research conducted by Devika Bhide which concluded that isometric training is far better for reducing pain and anxiety when adolescents experience primary dysmenorrhea (Devika Bhide, 2017).

4.3. The Effect of Dysmenorrhea Gymnastics Before and After On Decreasing Menstrual Pain

Dysmenorrhea when menstruation is an exercise that consists of movements that can relax the body and breathing methods that can reduce problems that arise during menstruation.

Based on table 1, the statistical test of Shapiro-wilk analytical normality before did gymnastics the significance value is 0.062 and after did gymnastics the significance value was 0.006. Thus the value is smaller than the value of α (5%) or 0.05, and then the data are not normally distributed so that the researcher conducts an alternative test that is Wilcoxon test.

The research results on the differences in the effects of dysmenorrhea gymnastics before and after on the level of menstrual pain showed that the average (mean) 5.17 with standard deviation of 1.114. At the time of dysmenorrhea gymnastics, the mean pain level of menstruation after did dysmenorrhea gymnastics was 3.26 with a standard deviation of 1.764 and the Wilcoxon statistical test value of 0.001. Thus the value is smaller than the value of α (5%) or 0.05 so that H_a is accepted which means there is significant influence on dysmenorrhea gymnastic in reducing the scale of menstrual pain in adolescent girls. The study results are in accordance with the theory which states that gymnastics can increase the number and size of blood vessels that supply blood throughout the body. So exercise is important for adolescent girls who experience dysmenorrhea because moderate and regular exercise will increase

the release of endorphin beta (natural pain relievers) into the bloodstream, so as to reduce menstrual pain or dysmenorrhea.

The study results are in line with Istiqamah Puji who stated that dysmenorrhea gymnastics are effective in reducing menstrual pain. Life quality will also improve when pain decreases after interfering with yoga therapy (Dr.S.P.Rajalakshmi and V.S.Viswanath, 2019). Another study by Reda Mohammed (2016) in Egypt showed that after doing dysmenorrhea gymnastic in respondents who experienced severe dysmenorrhea reduced from 35.5% to 12.5%. Research on Padjamu, Prasa (2019) in India, also showed that there was a significant decrease in pain scale after dysmenorrhea gymnastics when compared with physiotherapy. Dysmenorrhea gymnastics can increase the tension of muscles and blood vessels which rarely can reduce high blood pressure.

Dysmenorrhea gymnastics can increase the tension of muscles and blood vessels which rarely can reduce high blood pressure. With regular exercise or gymnastics, there is an increase in the volume of blood flowing throughout the body, including the reproductive organs so as to facilitate the supply of oxygen to the vasocontracted blood vessels, so menstrual pain can be reduced. In this study, gymnastics performed by adolescent girls initially did not give any effect because the exercise only once during the menstrual cycle. But adolescent girls feel a significant effect on decreasing menstrual pain after doing dysmenorrhea gymnastics regularly during one menstrual cycle. In this case, adolescents feel the benefits of dysmenorrhea gymnastics so they convey that they will carry out exercises every menstrual cycle compared to taking painkillers which clearly have side effects. This contradicts the study of Huein-Mein Chen (2018) in Taiwan who obtained results that exercise can improve the quality of life in adolescents and reduce menstruation significantly. MS Amal Suzanne's research (2018) in India also concluded that dysmenorrhea exercises can significantly reduce menstrual pain. The same thing was conveyed by Mike Amore (2019) in his research in Australia, namely dysmenorrhoeic exercise is more effective than analgesic administration in reducing menstrual pain. However, there are differences with research conducted by Kiramayi which states that there is no significant difference in reducing menstrual pain.

According to the researcher, the success of gymnastics as a beta endorphin release which is considered as a sedative that makes a sense of relaxation need to be considered hormones and

adolescent psychological which will interfere with the success of gymnastics.

5 CONCLUSIONS

This study shows a significant result that is after do anti-dysmenorrhea gymnastics, there is a decrease in menstrual pain. It shows the effect of anti-dysmenorrhea gymnastics with a decrease in menstrual pain. The pain level after anti-dysmenorrheagymnastics is mostly on a mild pain scale with a percentage of 60.9% this is because gymnastics can widen the blood and produce endorphin hormones so that menstrual pain can be overcome after doing gymnastics. This study shows different results from previous studies because of differences in time in the implementation of gymnastics. It is hoped that in subsequent studies an increase in sample spacing can be reached by research targets to find out the extent of the effect of dysmenorrhea exercises on decreasing menstrual pain.

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