

The Effectiveness Combination Of Abdominal Stretching Exercise On The Menstrual Cramps Intensity On Adolescent

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Abstract:

The purpose of this study was to determine the effectiveness of the combination of abdominal stretching exercises to reduce the intensity of menstrual cramps in adolescents in Palembang high school in 2020. This research using pre-experimental quantitative research methods with the research design of the one group pretest-posttest design. In this research design there is no control group or randomization. The research sample was 58 respondents. The results of the Wilcoxon test show that there is a significant difference between the dysmenorrhea pain of students before being given the Combination Abdominal Stretching Exercise treatment compared to after being given exercise treatment (p value= 0.00). Suggestions for further research related to the effectiveness of dysmenorrhea exercise by repeating treatments and increasing the frequency of treatment at the time before menstruation and menstrual period.

Key Words: Dysmenorrhea, Abdominal Stretching Exercise, Adolescent, Frequency Treatment

Introduction

Ministry of Health of Republic Indonesia (Kemenkes RI) is defined the “reproduction health” as a condition of physical, mental, and social health which connected with system, function and production process. Adolescent age range around 10-19 years, adolescents in this age limit experience various kinds of changes such as changes in body, changes in social status, sex and reproductive organs in particular which are marked by the presence of the first menstruation (menarche) in adolescent girls. Changes in reproductive health behavior, if not handled carefully, will have an impact on reducing the quality of family life in the future (BKKBN, 2018).

Menstruation is the periodic expulsion of blood and body cells from the vagina from the wall of a woman's uterus. Menstruation begins at puberty and marks a woman's ability to conceive. Menstruation usually begins between the ages of 10 and 16 years, depending on the woman's health, nutritional status and weight relative to height. Menstruation will take place approximately once a month until the woman reaches the age of 45-50 years (Fhadila, 2017).

Some women of childbearing age experience pain during menstruation. The pain is continuously in the

days before or early menstruation. The pain will be felt in the lower or middle abdomen sometimes even up to the hips, thighs, and back. The severity of the pain varies from woman to woman, and also between menstrual cycles in the same woman. Sometimes, the pain may be imperceptible. But it can also be at other times, the pain will feel very intense accompanied by seizures, weakness, fever, dizziness and various disorders such as nausea, vomiting, and diarrhea (Larasati & Alatas, 2016).

Pain during Menstruation (dysmenorrhea) is in the two forms there are dysmenorrhea Primary and Secondary. Primary dysmenorrhea happens after menarche which commonly early 6 into 12 months, the characteristics always same every menstruation cycle and always connected with ovulation cycle while secondary dysmenorrhea happens at all ages. Where the pain increases with age and worsens with time. The characteristics are different in each menstrual cycle where menstrual pain occurs related to pelvic pathological abnormalities (Larasati & Alatas, 2016).

The incidence of dysmenorrhea in the world is very large. On average, more than 50% of women in every country experiences dysmenorrhea. In America, the percentage figure is around 60% and in Sweden it is around 72% (Wulandari, Hasanah, & Woferst, 2018). Dysmenorrhea can have an impact on the activities of women, especially teenagers. For example, a student who experiences dysmenorrhea cannot concentrate on studying and learning motivation will decrease because of the dysmenorrhea that is felt in the teaching and learning process and sometimes someone asks for permission to go home because they cannot stand the dysmenorrhea they feel (Lail, 2019).

The research by Angelia, Sitorus, and Etrawati (2017) in SMA Palembang of 146 respondents who had experienced primary dysmenorrhea, 109 respondents (74.7%) there are have experienced Primary dysmenorrhea. While in Indonesia, the incidence of dysmenorrhea of 64.25% consist of 54.89% Primary dysmenorrhea and 9.36% secondary dysmenorrhea. The research by Sari (2017) in Deli of 130 respondents stated that many factors which influenced the occurrence of dysmenorrhea such as age of menarche, family history, lack of activity or exercise and imbalance in nutritional intake where adolescents generally prefer to snack on non-nutritive foods. This research is in line with research by Ade (2019) on the 42 respondents in the Yogyakarta boarding school which influencing in the Primary dysmenorrhea evidence which is family history and exercise habits.

There are many ways to remove or reduce the menstruation pain, both Pharmacologist and non-pharmacologist. Non-Pharmacologist management is more safety to use because does not cause side effects such as medicine (Misliani, Mahdalena, & Firdaus, 2019). There are several ways that can be done to overcome dysmenorrhea, namely taking a warm bath, putting a bottle on the stomach, exercising, and avoiding smoking. French (2005) (cited in Fauziah, 2015) stated that lifestyle modification to overcome dysmenorrhea which is low fat diet, exercise and stop smoking with acupuncture, acupressure.

Physical training can be used to reduce the dysmenorrhea during the menstruation there are

with abdominal stretching exercise which is an abdominal muscle stretching exercise that is carried out for approximately 10-15 minutes to increase muscle strength, endurance and muscle flexibility so that it is expected to reduce dysmenorrhea pain in adolescents (Hidayah, Rusnoto, & Fatma, 2017). The exercise stretching can overcome dysmenorrhea, stretching exercise is more safety and does not have a side effect because using the body physiologic. This research is in line with the research by Sormin (2014) in SMPN 2 Siantan Pontianak district on the 20 respondents who stated that the implemented exercise can increase blood flow in the pelvis and stimulates endorphins in the body which has an impact on reducing the pain scale.

The research by Windastiwi, Pujiastuti, and Mundarti (2017) in SMPN 1 Wonobojo on the 48 respondents stated that there is an effect of the stretching dysmenorrhea exercise on the reducing the menstruation cramps. The result by Fauziah (2015) in SMKA 1 Furqon Bantar Kawung Brebes district about the activity package reducing (abdominal stretching) on the 31 respondents to reducing the intensity of menstrual cramps of adolescent shows that the reducing package which consist of the mineral water therapy and abdominal stretching exercise is effectively in reducing the pain intensity of adolescent with dysmenorrhea. Abdominal stretching exercise is the exercise of abdominal muscle stretch. Abdominal stretching exercise is one of relaxation technique which can be used to reduce the pain. This causes the incensement of endorphin levels which produced by brain because exercise. Therefore, the physical exercise is acts as analgesic specification short terms can be reducing the pain (Ardiani & Sani, 2020).

The previous study in the SMA Palembang found that many students which experienced the menstrual cramps (dysmenorrhea) and while experienced the menstrual cramps, several student is permit to going home and finally cannot following the process of learning in the school. The problem above is interested to analyze by researcher to implementing the research about the effectiveness combination of abdominal stretching exercise on the intensity of menstrual pain on adolescent in SMA Negeri 22 Palembang in 2020 academic year. Based on the background above, the formulation of problem from this research; what is the effectiveness of the combination of abdominal stretching exercise on the intensity of menstrual pain in adolescents.

Material & methods

This research is the quantitative research of pre-experiment, with the research design of group pretest-posttest design. In this research, there is no control group or randomization. After implementing the research subject selection (single group), then implementing the measurement before and after interventions. The measurement research next is comparing with (measurement result before intervention and comparing with the measurement result after intervention) (Swarjana, 2015). The Population is the entire adolescent who experience menstrual cramps in Palembang City High School.

The sample in this research is the population totals of adolescent which experiences dysmenorrhea which found as 58 peoples who have the criteria as follows:

a. Inclusion criteria in this research is:

- 1) Students who experience menstrual pain on day 1 or day 2 or day 3 of menstruation.
- 2) That does not use pharmacological therapy during menstrual pain.
- 3) Students who have normal IMT.
- 4) Students who are willing to become respondents.

b. Inclusion criteria in this research is:

- 1) Suffer from certain gynecological diseases such as endometriosis, fibroids, adenomyosis, inflammation of fallopian tubes and others.
- 2) Have abnormalities on hip and spine.
- 3) Experiencing heavy dysmenorrhea.
- 4) Students who are willing to become respondents.

In this research, the variable that used is the dependent variable and independent variable. The dependent variable is the menstrual cramps (dysmenorrhea) while the independent variable is the exercises of abdominal stretching. The previous study in SMA Negeri 22 Palembang found that there are many adolescent who experiencing the menstrual cramps (dysmenorrhea) and when experiencing the menstrual pain some students asked permission to go home and finally unable to follow the learning process at school.

The problem above is interested to analyze which implementing the research about the effectiveness combination of abdominal stretching exercise on the intensity of menstrual cramps on the adolescent in SMA Negeri 22 Palembang. This research is the quantitative research of pre experiment, with the research formulation of the one group pretest-posttest design. In this research there is no control group or randomization. After implementing the selection of research subject (single group) then the implementation of measurement before and after intervention. The measurement result then compared with (measurement result before and after intervention and compared with the measurement result after intervention) (Swarjana, 2015).

Tools and materials

The research instrument is the tools that used to collect the data (Notoatmodjo, 2012). Tools and material that used in this research is SOP stretching exercise to implementing the stretching abdominal exercise while pain level measurement sheet with Faces Pain Scale-Revised (FPS-R). This tool is used instead of a pain word description tool (Visual Descriptor Scale). Faces Pain Scale-Revised (FPS-R) used smile face from the number 0 on the far left line which indicates no pain until the face is filled with tears

for the number 5 on the far right line indicates the pain is very unbearable/severe pain (Potter and Perry, 2012).



Source: (Smeltzer & Bare, 2013)

Figure 1. Faces Pain Scale- Revised Instrument

This tool is also tested good validity and reliability. The reliability test used the Interclass Correlation Coefficients (ICC's) and fourth scale shows the assessment consistency (0.673-0.825) and have the test power ($r= 0.71- 0.99$). To assessment with Faces Pain Scale-Revised (FPS-R), respondent is asked to sign one of the face which expressed the pain that felt.

Technique and data analysis

According to Sugiyono (2016) data analysis that commonly through step-by step procedure there are:

1. Univariate Analysis

Univariate analysis according to Masturoh and Nauri (2018) aimed to explains or describe the characteristic of every research variable. Univariate analysis aimed to see the frequency distribution illustration. Univariate data which analyzed to this research is illustrating pain level to respondents.

2. Bivariate Analysis

Bivariate analysis implemented to identify the relationship between 2 variables, which is identified the identify differences in the level of menstrual cramps before and after abdominal stretching exercises or whether, there is a relationship between the dependent variable and the independent variable. In this study, after testing the normality of the data, it was found that the data was not normally distributed, so the analysis that used is an alternative test, namely the Wilcoxon test.

3. Multivariate Analysis

The multivariate analysis method is a statistical method which purposed to analyze data consisting of many variables and it is suspected that these variables are related to each other (Santoso, 2018)

Results

These researches are implemented in the SMA Negeri 22 Palembang city and get the permission letter from:

1. Research permit from the Director of Poltekkes Palembang No: LB.02.02/1.1/3439/2020 (attached).
2. Permit letter from the National Unity and Political Agency of South Sumatra Province No: 070/1798/Ban.KBP/2020 (attached).
3. Research permit from the South Sumatra Provincial Education Office No: 420/899/SMA.1/Disdik.SS/2020 (attached).
4. Research permit from SMA Negeri 22 Palembang No: 421.3/422/017/Disdik.Prov.SS/SMAN.22/2021 (attached).
5. The subjects obtained in this study were 58 female students who experienced pain during menstruation.
6. Data collection was carried out in 2 stages, namely the first stage of collecting data on the characteristics of the subject by distributing online questionnaires, the second stage of direct exercise intervention at SMA Negeri 22 Palembang.
7. The intervention in this study was carried out for several times due to differences in the menstrual schedule or menstruation for each respondent, so it could not be done at the same time. It has been carried out in eight activities for 58 respondents, so each specified date can only collect 7-8 respondents for exercise intervention or Abdominal stretching exercise.

Environment of SMA Negeri 22 Palembang

SMA Negeri 22 Palembang as one of the educational institutions within the National Education Office of Palembang City, South Sumatra Province which has the function and task of improving the quality of public education has an interest in continuing to develop the quality of education, through the gradual and planned development of human resources. SMA Negeri 22 Palembang is located in Alang – Alang Lebar District, Palembang city with a distance of +/- 14 KM from the office of the Mayor of Palembang, the capital city of South Sumatra Province. The school is located on the edge of the city, so the school atmosphere is comfortable for teaching and learning, far from noise with a population density of 266 peoples /km². The students of SMA Negeri 22 Palembang are students who come from the Alang-alang Lebar District and Sukarami District, Palembang City. There is also a small proportion from outside Palembang City, Banyuasin Regency, and other regencies.

Table 1. Study data groups and number of students of SMA Negeri 22 Palembang in last four (4) years
Univariate analysis

Year Teaching/ Number of Registrants	class I		class II		class III		Total (I+II+III)	
	Number of students	Number of groups	Number of students	Number of groups	Number of students	Number of groups	Number of students	Number of groups
2013-2014	389	10	320	9	250	6	959	25
2014-2015	423	11	377	10	312	9	1.112	30
2015-2016	438	11	423	11	370	10	1.231	32
2016-2017	393	10	430	11	417	11	1240	32
2017-2018	399	12	378	10	413	11	1190	33
2018-2019	314	9	387	12	379	10	1080	31
2019-2020	360	10	317	9	386	12	1063	31

Table 2. Characteristics of research subjects

Characteristic Variable	Median	Minimum	Maximum
	N=58		
Age	15	14	17
Menarch	12	10	14
Weight	50	33	80
Height	158	105	169
Pain before	4,5	4	8
Pain after	3	1	6

From the table 2, respondents characteristic noted that the median value of the students was 15 years old, menarche at 12 years old, weight 50 kg, height 158 cm, pain before 4.5 (moderate pain), pain after 3 (mild pain). The analysis of differences in student dysmenorrhea pain scale before and after intervention.

Table 3. Differences in students' dysmenorrhea pain scale before and after intervention

Gymnastic Treatment	N	Median	Min-Max	P-Value
Before	58	4,5	4-8	0.00
After	58	3	1-6	

*Uji Wilcoxon

The median mean of the pain scale of students with menstrual pain before being given exercise treatment was 4.5 (min 4 – max 8) and decreased after being given exercise treatment, which was to 3 (min 1 – max 6). The Wilcoxon test statistical analysis was carried out on the menstrual cramps level variable. This is caused the distribution of pain level data is not homogeneous. After the Wilcoxon test was conducted, it was found that there was a significant difference between the students' dysmenorrhea pain before being given the Abdominal Stretching Exercise Combination treatment compared after being given the exercise treatment (p value = 0.00).

Discussion

The result is shows in the table 1 can be seen that from 58 respondents on the menstrual cramps scale can be reduced after the intervention of abdominal stretching exercise. This is in accordance with stretching theory is the simple physical activity. Stretching according to Shirvani, Motahari-Tabari, and Alipour (2017) is a practice to maintain and develop the flexibility and stretching. As for one way of exercise to reduce the intensity of menstrual cramps is to do abdominal stretching exercise. This is because when doing abdominal stretching exercise the body will produce endorphins. Endorphins are produced by the brain and spinal cord which function as natural sedatives produced by the brain, causing a sense of comfort (Syaiful & Naftalin, 2018).

Pain during menstruation can occur due to muscle problems around the hip cavity (Ferries-Rowe, Corey, & Archer, 2020). Disorders of this muscle can also cause spasms, muscle tension, and back pain. In addition to pain, problems that often occur due to these muscles are not smooth menstrual cycles. To overcome these two things, there are exercise movements that aim to improve muscle condition for the better which are sports exercises (Haryono, 2016). Abdominal stretching exercise can

be helps increase oxygenation or the process of exchange of oxygen and carbohydrates in cells that experience vasoconstriction and stimulates the flow of drainage before lymph, so it will increase the muscle flexibility thereby reducing muscle cramps (Syafna, Dewi, Rahmalia, Damanik, & Keperawatan, 2018).

The physical exercise can be used to decrease dysmenorrhea during menstrual there are abdominal stretching exercise which is an abdominal muscle stretching exercise that is carried out for approximately 10-15 minutes to increase muscle strength, endurance and muscle flexibility so that it is expected to reduce dysmenorrhea pain in adolescents (Hidayah et al., 2017). Abdominal stretching exercise is an abdominal muscle stretching exercise. Abdominal stretching exercise is one of the relaxation techniques that can be used to reduce pain. This is due to increased levels of endorphins produced by the brain due to exercise. Therefore, this physical exercise acts as a specific analgesic for the short term to relieve pain (Ardiani & Sani, 2020). From the characteristics of this study were the median value of the students was 15 years old, menarche at 12 years old, weight 50 kg, height 158 cm, pain before 4.5 (moderate pain), pain after 3 (mild pain). This is in accordance with the theory that there are several levels of pain during menstruation. Each menstruation causes pain, especially at the beginning of menstruation but with different levels of pain. According to Larasati and Alatas (2016), dysmenorrhea is divided into three levels of severity, namely: Mild dysmenorrhea, a person will experience pain or can still be tolerated because they are still on the threshold of stimulation, last for a while and can continue their daily work. Mild dysmenorrhea is on a pain scale with a level of 1-4, for a mild dysmenorrhea facial scale there is a pain scale with a level of 1-2. Dysmenorrhea is someone who begins to respond to his pain by moaning and pressing on the painful part, painkillers are needed without leaving his job. Moderate dysmenorrhea is on a pain scale with 5-6 levels, for the facial scale, moderate dysmenorrhea is on a pain scale with 3 levels.

High Dysmenorrhea of a person complains of a burning feeling, there is a possibility that someone is no longer able to do normal work and needs to rest for a few days. This can be accompanied by headaches, migraines, fainting, diarrhea, feeling depressed, nausea, and abdominal pain. Severe dysmenorrhea is on a pain scale with levels 7-10, for facial scales severe dysmenorrhea is on a pain scale with levels 4-5. This result from 58 respondents in the table 3 the median mean of the pain scale of students with menstrual pain before being given the Abdominal Stretching Exercise Combination exercise treatment was 4.5 (min 4 – max 8) and decreased after being given the Abdominal Stretching Exercise Combination exercise treatment, which was 3 (min 1 – max 6). Wilcoxon test statistical analysis was carried out on the menstrual pain level variable. This causes the distribution of pain level data is not homogeneous. After the Wilcoxon test was carried out, it was known that there was a significant difference between the students' dysmenorrhea pain before being given the Abdominal Stretching Exercise Combination exercise treatment compared to after being given the Abdominal

Stretching exercise treatment (p value = 0.00). This is in line with the result from Windastiwi et al. (2017) in SMPN 1 Wonobojo on the 48 respondents stated that there are an effect of stretching dysmenorrheal on the decreasing the menstrual cramps. The result of Fauziah (2015) in SMK Al Furqon Bantarkawung Brebes district about the effectiveness of the relief package (abdominal stretching) on the 31 respondents to decrease the menstrual cramps intensity on adolescent shows that the relief package consisting of drinking water therapy and abdominal stretching exercise is effective in reducing pain intensity in adolescents with dysmenorrhea.

Stretching exercise can overcome dysmenorrhea, stretching exercise is safer and no contains side effect because using the physiological processes of the body. This research is in line with the research from Sormin (2014) in SMPN 2 Siantan Pontianak district on 20 respondents stated from implemented exercise can increase blood flow in the pelvis and stimulates endorphins in the body which has an impact on reducing pain scale. Menstrual cramps can be occurs because muscle problems around the pelvic cavity. The Disorders of this muscle cause spasms, muscle tension, and back pain. In addition to pain, problems that often occur due to these muscles are not smooth menstrual cycles. To overcome these two things, there are exercise movements that aimed to improve muscle condition for the better which are sports exercises (Haryono, 2016). Abdominal stretching exercise can helps increase oxygenation or the process of exchange of oxygen and carbohydrates in cells that experience vasoconstriction and stimulates drainage flow before lymph, so that it can increase muscle flexibility thereby reducing muscle cramps, especially during menstruation.

Conclusions

To summarize, it is known that the median value is 15 years old, menarche at 12 years old, weight 50 kg, height 158 cm, pain before 4.5 (moderate pain), pain after 3 (mild pain). It is known that 58 respondents on the menstrual cramps scale can be reduced after the exercise intervention. There is a significant difference between students' dysmenorrhea pain before being given exercise treatment compared to after being given exercise treatment (p value = 0.00). For further research is needed regarding the effectiveness of dysmenorrhea exercise with repeated treatment, and increasing the treatment frequency before menstruation and during menstruation. This exercise can be done on high school students with complaints of dysmenorrhea pain on a regular basis.

Conflicts of interest

The author declares there is no conflict of interest

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