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The Effect of Abdominal Stretching Exercise on Reducing the Intensity of Dysmenorrhea Pain

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ABSTRACT

Dysmenorrhea is a gynecological complaint that occurs due to an imbalance in the hormone progesterone, resulting in pain that women often experience during menstruation. One non-pharmacological way to deal with dysmenorrhea pain is to do abdominal stretching exercises. This study aimed to determine the effect of abdominal stretching exercise on reducing the intensity of dysmenorrhea pain in students of the Midwifery Diploma Study Program (MDSP), at Bengkulu University. This research was a pre-experimental study with a one-group pre-test and post-test design, involving 57 respondents who experienced moderate-category primary dysmenorrhea. Samples were taken using a random sampling technique. Data was collected using Standard Operational Procedures for abdominal stretching exercises and the Wong-Baker pain rating scale to determine the scale of dysmenorrhea pain. The results of data analysis using the Wilcoxon test showed p-value = 0.000 with a significance level of α = 0.05. This indicates an effect of abdominal stretching exercises on reducing dysmenorrhea in students of the MDSP.

Introduction

The incidence of dysmenorrhea is still a problem in women, the incidence of dysmenorrhea in the world is recorded to be very high, according to WHO (World Health Organization) 2021 data, the incidence of dysmenorrhea has increased by around 1,769,425 people (90%) of women with severe dysmenorrhea by around 10 – 15%. The prevalence of dysmenorrhea in Indonesia is 64.25%, divided into 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea. Dysmenorrhea is also a problem and complaint of students in the MDSP which causes their daily activities to be disrupted and hampered, students find it difficult to contract during lectures, so students need pain relievers and time to rest.

Based on the results of the initial survey data that researchers conducted on September 18 2023 by distributing questionnaires to the MDSP students. The total students are 274 students, consisting of 72 students from level I, 94 students from level II, and 108 students from level III. 273 students filled out the questionnaire and the results showed that 65 students experienced moderate primary dysmenorrhea, including 16 people from level I, 22 people from level II, and 27 people from level III. The students said the dysmenorrhea they were experiencing affected their daily activities, they had difficulty contracting during lectures, so they needed pain relievers. The efforts made by students when they experience dysmenorrhea include taking medicine, drinking herbal medicine, warm compresses, exercising, resting or sleeping and the rest say they don't do anything.

Dysmenorrhea is caused by symptoms that include abdominal pain, cramps, and back pain. Gastrointestinal symptoms such as nausea and diarrhea can occur as symptoms of menstruation. Then dysmenorrhea is divided into two, namely primary dysmenorrhea and secondary dysmenorrhea [1]. Primary dysmenorrhea is pain that usually occurs due to pelvic pathology and secondary dysmenorrhea is menstrual pain associated with various pathological conditions of the genital organs such as endometriosis and pelvic inflammatory disease [2]. The effects of dysmenorrhea include having difficulty sleeping, feeling restless, moody, irritated, and not being able to relate well to other people, which can affect productivity and quality of life [3].

The actions taken to treat dysmenorrhea are pharmacological and non-pharmacological therapy. Pharmacological treatments that are frequently used are NSAIDs (Nonsteroidal Anti-Inflammatory Drugs) such as mefenamic acid, ibuprofen, sodium diclofenac, and naproxen. As for non-pharmacological treatment management, such as warm baths, warm compresses, herbal drinks, relaxation, acupressure, and physical or exercise. This non-pharmacological management is safer because it does not cause side effects like medications. Handling dysmenorrhea is very important, one of the efforts that can be made is non-

pharmacological therapy by doing exercise techniques, namely abdominal stretching exercises, which can relieve dysmenorrhea with few side effects [4].

The previous research showed that abdominal stretching exercise could significantly reduce the intensity of dysmenorrhea pain, as evidenced by the average score for 40 respondents before carrying out the abdominal stretching exercise intervention, namely 0.63, while the average score after the abdominal stretching exercise was 0.39. This shows that there is a decrease in the pain scale before and after doing abdominal stretching exercises with p = value 0.00 [5]. Other research also shows that abdominal stretching exercise can reduce the intensity of dysmenorrhea pain as evidenced by the average intensity of dysmenorrhea pain in adolescent girls before the intervention was 4.58 and after the intervention was given it decreased to 1.46 [6].

Material and Methods

This research is a quantitative research with a pre-experimental approach. The method used in this research is the one-group pre-test and post-test design. This research was conducted at the MDSP from 17 November 2023 to 17 December 2023. The sample size in this study measured using Slovin Formula was 57 students who experienced moderate dysmenorrhea. The samples were selected using random sampling techniques, but 3 people withdrew during the research so the total number of people who took part in the study was 54 respondents. The independent variable is abdominal stretching exercise and the dependent variable is a decrease in the intensity of dysmenorrhea pain. Data was collected using Standard Operational Procedures for abdominal stretching exercises and the Wong-Baker pain rating scale to determine the scale of dysmenorrhea pain. Then the data was analyzed using the Wilcoxon test.

Results and Discussion

Based on Table 1, all 54 respondents admitted that they felt their activities were disturbed when they experienced dysmenorrhea, and the majority of respondents felt pain in the lower part of the stomach, extending to the lower back and thighs, 29 people (53.65%). Apart from that, it shows that the majority of 54 respondents overcome dysmenorrhea only by resting, namely 39 people (72.15%) and the majority have never received information about abdominal stretching exercises, 39 respondents (72.15%).

Menstruation is usually experienced by women of childbearing age (WUS), women who are not pregnant and have not yet experienced menopause. Based on the results of this study, it is by the theory that primary dysmenorrhea usually occurs at the age of 15 to 25 years and then disappears at the end of the age of 20 to 30 years without any abnormalities in the genital

organs during a gynecological examination. The cause is the cervix which dilates with age, so dysmenorrhea rarely occurs in old age [7].

Table 1. Respondent's Characteristics

Characteristics	Frequency	Percentage (%)
Age (Years old)		
17	2	3.7%
18	14	25.9%
19	15	27.75%
20	16	29.6%
21	7	12.95%
Menarche (Years Old)		
≤ 10	1	1.85%
10-13	30	55.5%
>13	23	42.5%
Menstrual Cycle (Days)		
< 21	17	31.45%
22-34	33	61.05%
> 35	4	7.4%
The length of Menstruation (Days)		
< 2	0	0%
2-7	46	85.1%
> 7	8	14.8%
Effecting/disturbing activities or not		
Yes	54	100%
No	0	0%
The Duration of Pain (Days)		
1-2 hari	54	100%
3-6 hari	0	0%
> 7 hari	0	0%
Symptoms		
Pain in the lower abdomen, extending to the lower back and thighs	29	53.65%
Pain in the stomach only	25	46.25%
Treatments		
No (just ignore it)	15	27.75%
Rest	39	72.15%
Take medicine	0	0%
Drink Herbal Medicine	0	0%
Information about abdominal stretching		
Ever Heard	15	27.75%
Never Heard	39	72.15%
Source of information about abdominal stretching Excercise		
No one/Nothing	39	72.15%
Internet	14	25.9%
Health Workers	1	1.85%
Parents	0	0%
Print Media	0	0%
Friend	0	0%
TV	0	0%

The results of this study showed that of the 54 respondents, the majority experienced their first menstruation at the age of 10-13 years, 30 people (55.5%). This follows the theory that states that if the age of menarche occurs too early (≤ 12 years), where the reproductive organs have not yet fully developed and narrowing of the cervix is still occurring, it will cause dysmenorrhea during menstruation [8]. Based on the characteristics of the menstrual cycle, it can be seen from the 54 respondents that the majority of their menstrual cycles are 22-34 days apart, 33 people (61.5%). The theory is that the menstrual cycle is the period between the first day of menstruation to the first day of the next menstruation. It is said to be normal if the period is 21-35 days. A cycle is considered abnormal if it is shorter than 21 days or longer than 35 days [9].

Based on the characteristics of menstrual duration, it can be seen that the majority of 54 respondents had a menstrual period of 2-7 days, 46 people (85.1%). According to research conducted by Ref. [10] found a correlation between the length of menstruation and dysmenorrhea. The results of the chi-square test showed a p-value = 0.045, which indicated a significant relationship between the duration of menstruation and dysmenorrhea. Based on the theory, women who experience menstruation that lasts longer than normal tend to feel pain during menstruation. This is caused by excessive contraction of the uterine muscle during the secretory phase, which results in excessive production of prostaglandin hormones [11]. Several women with normal menstrual periods can experience dysmenorrhea due to unhealthy lifestyles, such as consuming junk food regularly, smoking, and lack of physical activity. This can trigger an increase in the intensity of pain during menstruation [10].

The research results showed that all 54 respondents (100%) experienced dysmenorrhea when their activities were disrupted. Research conducted by Ref. [12] of 118 female students from the DIII Midwifery study program, found a correlation between dysmenorrhea and learning activities. The analysis results show that the Sig. (2-tailed) for body mass index is 0.00 < 0.05, indicating a relationship between the independent variable and the dependent variable. Based on the length of pain felt, it can be seen that all 54 respondents (100%) experienced dysmenorrhea pain for 1-2 days. In this study, students who experienced dysmenorrhea would appear on the first and second days. According to theory, primary dysmenorrhea generally begins with the start of menstruation and lasts for 8-48 hours [13].

Based on research results, the majority during menstruation feel pain in the lower abdomen, extending to the lower back and thighs as many as 29 people (53.65%). According to the theory, primary dysmenorrhea causes several symptoms, including pain during menstruation accompanied by lower abdominal cramps that spread to the back and thighs. It is associated with general symptoms, namely, feeling unwell, fatigue, nausea, vomiting,

diarrhea, lower back pain, headaches, and sometimes accompanied by feelings of anxiety [14]. The research results also showed that the majority of 54 respondents who experienced dysmenorrhea dealt with it by resting, 39 people (72.15%). This is supported by the theory that rest is a condition where a person is in a relaxed state without emotional stress and by resting he can divert his mind from the pain he is experiencing so that rest can relieve stomach pain that is not felt but can also provide additional energy [15]. Most of them never received information and sources of information about abdominal stretching exercises, 39 people (72.15%). In line with research conducted by Ref. [16] in adolescent girls, data was obtained that all 42 respondents (100%) had never received information about treating dysmenorrhea by carrying out abdominal stretching exercises.

Based on Table 2, the dysmenorrhea pain scale among students of the D3 Midwifery Study Program at Beengkulu University before the abdominal stretching exercise intervention was given, all of the respondents were on the moderate pain scale, whereas after being given the abdominal stretching exercise in exercise 1, there were 35 respondents (64.8%) experienced decreased to mild pain scale and 27 respondents only experienced slight pain (27.8%). From the results of the Wilcoxon test, it is known that the P-value = 0.000, which means there is a significant difference in pain levels before and after the treatment is given. In other words, the abdominal stretching exercises in this study influence the level of extrusive pain.

Table 2. The intensity of dysmenorrhea pain before and after abdominal stretching during 1st exercise

Level of Pain	Pre-Test		Post-Test		P-value
	f	%	f	%	
No pain	0	0	0	0	0.000
Small pain	0	0	15	27.8	
Mild pain	0	0	35	64.8	
Moderate pain	54	100	4	7.4	
Total	54	100	54	100	

Meanwhile, after administering the second exercise, there was a notable improvement in pain levels among the respondents. Specifically, the proportion of individuals reporting moderate pain dropped to 0%, indicating that no participants were experiencing this level of discomfort. The majority of respondents reported only minor pain, accounting for 51.9% of the sample. Furthermore, a significant percentage of respondents, 40.7%, indicated that they no longer felt any pain at all.

The effectiveness of the second exercise in reducing pain was statistically confirmed by the Wilcoxon test, which yielded a P-value of 0.000. This result is highly significant, suggesting that the observed improvements in pain levels are unlikely to be due to random chance. For a detailed breakdown of the pain levels before and after the intervention, please refer to Table 3.

Table 3. The intensity of dysmenorrhea pain before and after abdominal stretching during 2nd exercise

Level of Pain	Pre-Test		Post-Test		P-value
	f	%	f	%	
No pain	0	0	22	40.7	0.000
Small pain	0	0	28	51.9	
Mild pain	0	0	4	7.4	
Moderate pain	54	100	0	0	
Total	54	100	54	100	

In theory, research conducted by Ref. [17] explains that a neuroendocrine response will take place when a person experiences stress. Corticotrophin-releasing hormone (CRH) is the main regulator of the hypothalamus stimulating the release of adrenocorticotrophic hormone (ACTH) from the anterior pituitary. This increases the release of glucocorticoids, especially cortisol in the adrenal glands. An increase in glucocorticoids will suppress the secretion of GnRH in the hypothalamus, thereby inhibiting the release of follicle-stimulating hormone (FSH) and luteinizing hormone (LH), as a result of which follicle development will be disrupted. Low progesterone levels increase the synthesis of prostaglandins F2α and E2. An excessive increase in prostaglandins causes uterine hypercontraction which reduces blood flow to the uterus and causes ischemia thereby increasing the sensitivity of nerve fibers which causes dysmenorrhea. Stress-related hormones, including adrenaline and cortisol, also influence prostaglandin synthesis suggesting stress has both direct and indirect effects on prostaglandin concentrations in the myometrium.

Research conducted by Ref. [18] showed that there was a significant difference between the pre-test and post-test pain scales so abdominal stretching exercise influenced reducing the level of dysmenorrhea pain. Research Ref. [19] conducted on teenagers showed that abdominal stretching exercises can reduce dysmenorrhea pain as seen based on the deep-seated t-test with a p-value of 0.000, meaning that there is an effect of abdominal stretching exercises on reducing menstrual pain.

Abdominal stretching is an effective relaxation technique used to reduce pain, which is carried out for 10-15 minutes. This is because when I do sports or exercise, my body produces endorphins. What is done regularly can increase the number and size of blood vessels, which

distribute blood throughout the body, including reproductive organs, so that blood flow appears smooth and this can reduce the symptoms of dysmenorrhea [18]. The abdominal stretching exercise also helps blood flow to the uterus and relaxes the uterine muscles so that anaerobic metabolism does not occur which will produce lactic acid, which if there is a buildup of lactic acid can cause pain or muscle cramps. So to facilitate blood circulation which carries oxygen, non-pharmacological therapy is needed, such as abdominal stretching exercises, so that an oxidation process occurs that reduces lactic acid levels which can relax the cramped abdominal muscles so that menstrual pain can be reduced [20].

The results of this research are supported by research conducted by Ref. [21] described that the abdominal stretching exercise technique can reduce dysmenorrhea pain in adolescents. One of the advantages of the abdominal stretching exercise technique is that it releases the hormone endorphin which has the effect of lowering the pain scale. This research is also supported by the research of Ref. [22] which was carried out on female teenagers at SMP Negeri 3 Limboto, which found that abdominal stretching exercise can reduce dysmenorrhea pain seen from the results of the pre-test before the abdominal stretching exercise intervention was carried out. The average dysmenorrhea pain intensity score in female students was 4.27 after the abdominal intervention was carried out. stretching exercises average dysmenorrhea pain intensity score in female students decreased to 1.93.

Conclusion

From the research conducted on 54 respondents at the MDSP, the dysmenorrhea scale among the students after being given the abdominal stretching exercise intervention experienced a decrease in the dysmenorrhea scale (p-value = 0.000, $\alpha = 0.05$) after 1st exercise and 2nd exercise. It can be concluded that there is an influence of the abdominal stretching exercise on reducing the intensity of dysmenorrhea pain. Therefore, people are expected to be able to apply techniques to reduce dysmenorrhea pain by doing abdominal stretching exercises, especially for teenagers and women who experience dysmenorrhea.

Conflict of Interest

The authors declare that there is no conflict of interest.

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