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# Effectiveness Of Abdominal Stretching Exercises On Reducing Dysmenorrhea In High School Students In East Aceh District

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***Abstract***

*Menstruation is a natural process in which the inner lining of the uterus (endometrium) is shed through the vagina. Menstruation often causes symptoms such as lower abdominal pain, constipation, diarrhea, thigh pain, breast tenderness, bloating, headaches, nausea, vomiting, backaches, fatigue, irritability, loss of balance, clumsiness, and disturbed sleep. In severe cases, symptoms such as inability to perform tasks or fainting can even occur. These symptoms are known as dysmenorrhea. Dysmenorrhea is painful menstrual flow. In school-aged adolescents, dysmenorrhea can significantly disrupt daily activities, sometimes requiring them to miss school. Abdominal stretching exercises are a physiotherapy intervention to reduce dysmenorrhea. The purpose of this study was to determine the effectiveness of abdominal stretching exercises in reducing dysmenorrhea in high school students in east aceh regency. This research design uses an experimental research method with one group pre and post test design. The sample size was 15 people. This study was conducted for 8 weeks with a frequency of 3 times a week and a duration of 10-15 minutes per exercise session. Pain measurement used nrs (numeric rating scale). The results of statistical analysis significantly showed a decrease in pain after the intervention p = 0.000 (p <0.05) with a mean value before the intervention of 7.51 ± 0.91 and after the intervention of 4.20 ± 0.86. The conclusion of this study is that abdominal stretching exercise is effective in reducing dysmenorrhea in high school students in east aceh regency.*

***Keywords: Dysmenorrhea, Menstrual Pain, Abdominal Stretching Exercise***

## INTRODUCTION

Adolescence, a period of reproductive age, is the transition from childhood to adulthood, beginning with the emergence of secondary sexual characteristics and ending with the cessation of body growth, around the ages of 11 to 19 (World Health Organization (WHO) 2018). Adolescence is a transitional period from childhood to adulthood. During this period, several changes occur, both physical and biological. The first physical change is puberty, followed by biological changes, usually marked by menstruation (Indrawati et al., 2023).

Menstruation is a natural process of shedding the inner lining of the uterus (endometrium) through the vagina. Menstruation occurs due to the influence of the FSH-Estrogen or LH-Progesterone hormones, which experience a decrease, especially in the progesterone hormone. During menstruation, complaints often occur such as lower abdominal pain, constipation, diarrhea, sore thighs, breast pain, bloating, headaches, nausea, vomiting, back pain, feeling tired, irritable, loss of balance, becoming careless, and disturbed sleep, even in severe cases complaints such as being unable to do anything to the point of fainting (Kusmiran, 2014 in (Akhir, 2014).

Dysmenorrhea comes from ancient Greek, the word comes from dys which means (difficult, painful, abnormal) meno which means month and rrhea which means flow or current. Dysmenorrhea can be defined as painful menstrual flow. Dysmenorrhea is not a disease, but rather a symptom that arises due to abnormalities in the pelvic cavity and interferes with women's activities, even often impacting school-age adolescents because it causes disruption to activities daily life. Dysmenorrhea is pain in the lower pelvic area extending to the back during menstruation and is caused by increased production of chemicals called prostaglandins or lower abdominal cramps accompanied by pain and

an imbalance of the hormone progesterone in the blood. During menstruation, there is an increase in prostaglandin secretion in the menstrual blood. Prostaglandins strengthen myometrial smooth muscle contractions and uterine blood vessels, resulting in hypoxia, which causes intense pain during menstruation (Septiana, Khayati, and Machmudah, 2022).

Data, 1,769,425 (90%) women suffer from dysmenorrhea, with 10%-16% suffering from severe dysmenorrhea. The incidence of dysmenorrhea worldwide is very high, with an average of more than 50% of women suffering from it (Herawati, 2021). In Indonesia, the number of women with dysmenorrhea is The incidence of dysmenorrhea is 64.25%, consisting of 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea. Over the past 50 years, 75% of women have experienced menstrual cramps. Reproductive health during adolescence is part of the Ministry of Health's efforts to achieve adolescent health well-being, preparing them to become healthy and productive adults by maintaining, preserving, and improving their health. Regular exercise and physical activity in adolescents are factors contributing to the achievement of this goal. Physiotherapy, as a healthcare professional, plays a role in developing, maintaining, and restoring movement and body function throughout the lifespan using various methods such as manual handling, increased mobility, the use of equipment (physical and electrotherapeutic), and training (Ministry of Health of the Republic of Indonesia, 2015). Abdominal stretching exercises are stretching exercises to maintain and develop abdominal flexibility to reduce menstrual pain. They are performed during dysmenorrhea to increase muscle strength, endurance, and flexibility for 10 minutes (Thermacare, 2010).

Based on this background, this study aims to determine the effectiveness of abdominal stretching exercises in reducing dysmenorrhea in high school students in in East Aceh District.

## RESEARCH METHODS

This research was experimental with a one-group pre- and post-test design. This study was conducted to determine the effectiveness of abdominal stretching exercises in reducing dysmenorrhea in female high school students in East Aceh Regency.

The population in this study were female high school students in East Aceh Regency. The sample was selected based on the following inclusion criteria: (1) aged 16-19 years, (2) experiencing dysmenorrhea during menstruation, (3) not currently participating in a regular exercise program, (4) having a regular menstrual cycle, and (5) being willing to participate in the study until completion. The study sample consisted of 15 participants, who received abdominal stretching exercises for 8 weeks, three times a week, and each session lasted approximately 10-15 minutes.

The instruments used in this study were: (1) an observation sheet to record observations before and after the abdominal stretching exercise intervention, and (2) pain measurement using the NRS (Numeric Rating Scale). Scores range from 0 to 10, with 0 indicating no pain, 1 to 3 indicating mild pain, 4 to 6 indicating moderate pain, 7 to 9 indicating severe pain, and 10 indicating the most severe pain (Hawker, 2011). Participants were asked to choose the number that best described their pain. The Numeric Rating Scale (NRS) was used to evaluate pain intensity before and after the Abdominal Stretching Exercise intervention. Data were collected through interviews with participants to obtain information about their condition related to dysmenorrhea. This study was conducted in East Aceh Regency from August to September 2025.

The data were processed using SPSS version 17 computer software. The data analysis included: (1) Descriptive statistical tests to analyze characteristics such as age, height, weight, BMI, exercise habits, and menstrual duration. (2) Data normality tests using the Shapiro-Wilk Test to determine whether the data were normally distributed. If the p-value is greater than 0.05 ($p>0.05$), then the data is normally distributed. (3) Comparative data before and after the Abdominal Stretching Exercise intervention on reducing dysmenorrhea in high school students in East Aceh Regency using a parametric test (paired sample t-test) if the data is normally distributed.

## RESULTS AND DISCUSSION

Based on the table below, the average age is 17 years, indicating that this study sample represents the adolescent age group. The average weight is 48.93, height 152, and BMI 21.16, indicating that this study sample is categorized as normal. Nine people in the sample never exercised, and six rarely exercised, indicating that those in the sample who rarely and never exercised are at risk of developing dysmenorrhea. One sample had a 5-day menstrual cycle, five had a 6-day menstrual cycle, and nine had a 7-day menstrual cycle. This indicates that menstrual length has no effect on the incidence of dysmenorrhea; a normal menstrual cycle is 3-7 days.

The characteristics of the study subjects, including age, body mass index (BMI), exercise habits, and menstrual length, are shown in the table below.

**Table 1. Characteristics of the Research Sample**

| No | Karakteristik Sampel | n = 15<br>Mean ± SD |
|---|---|---|
| 1 | Age (years) | 17 ± 0.92 |
| 2 | BW (kg) | 48.93 ± 3.55 |
| 3 | HH (cm) | 152.13 ± 2.87 |
| 4 | Body Mass Index (BMI) | 21.16 ± 1.95 |
| 5 | Exercise Habits<br>1. Never = 9<br>2. Rarely = 6 | 1.60 ± 0.50 |
| 6 | Menstrual Duration (days)<br>1. 5 Days = 1<br>2. 6 Days = 5<br>3. 7 Days = 9 | 6.53 ± 0.50 |

**Table 2. Data Normality Test**

| Abdominal Stretching Exercise | Normalitas Data Dengan *Shapiro Wilk Test* | Keterangan |
|---|---|---|
| Pre Test | 0.082 | Normal |
| Post Test | 0.050 | Normal |
| Difference | 0.059 | Normal |

The normality test for data before the abdominal stretching exercise intervention (pre-test) showed p = 0.082 (P>0.05), indicating a normal distribution. After the abdominal stretching exercise intervention (post-test), p = 0.050 (P>0.05), indicating a normal distribution.

**Table 3. Hypothesis Test**

| Abdominal Stretching Exercise | n | Mean ± SD | *p* |
|---|---|---|---|
| Pre test | 15 | 7.53 ± 0.91 | 0.000 |
| Post test | 15 | 4.20 ± 0.86 | |

Statistical analysis using the Paired Samples t-Test showed a p-value of 0.000 (P<0.05). These results indicate that abdominal stretching exercises significantly reduced dysmenorrhea in high school students in East Aceh Regency. These findings align with previous research by R. Supini (2024), which found an effect of abdominal stretching on dysmenorrhea levels in 11th-grade female students at SMAN 1 Suela. Abdominal stretching exercises involve stretching the abdominal muscles, lower back, and pelvis. These exercises aim to increase muscle strength, endurance, flexibility, and relieve menstrual pain (Asniati et al., 2023).

The decrease in progesterone hormone levels during pregnancy causes the endometrium to contract to expel menstrual blood. During menstruation, the myometrium, endometrium, and perimetrium contract more strongly than during non-menstrual periods. This is caused by an increase in the hormone prostaglandin released by the endometrium. Prostaglandins stimulate contractions in the uterine muscles and help shed the endometrial lining. Higher prostaglandin levels increase the strength of uterine muscle contractions, leading to dysmenorrhea. These strong contractions cause blood vessels to constrict and reduce oxygen flow. Strong muscle contractions and reduced blood flow further trigger menstrual pain.

The exercise techniques used in abdominal stretching exercises stretch the abdominal muscles, which can help reduce muscle tension. This increases muscle strength, endurance, and flexibility, reduces muscle tension, cramps, and causes blood vessel vasodilation, thus improving blood circulation to the reproductive organs experiencing spasm or ischemia. (Arifiani, 2016).

Abdominal stretching exercises are effective because they stimulate endorphins, which reduce pain levels. Endorphins are produced in the brain and spinal cord. This hormone acts as a natural sedative, creating a feeling of well-being. Increased endorphin levels in the body can reduce pain during contractions. Exercise has been shown to increase endorphin levels four to fivefold in the blood, so the more exercise you do, the higher your endorphin levels will be. When someone performs abdominal stretching exercises, endorphins are released and captured by receptors in the hypothalamus and limbic system, which regulate emotions. Increased endorphins have been shown to be closely linked to reduced pain (Kusuma, 2019).

## CONCLUSIONS

Abdominal stretching exercises have been proven effective in reducing dysmenorrhea in high school students in East Aceh Regency. This intervention has a positive impact on reducing menstrual pain, is easy to perform, safe, and can be a non-pharmacological alternative for managing dysmenorrhea in adolescent girls.

Abdominal stretching exercises are recommended for routine implementation in schools as part of reproductive health education. Future research should involve larger samples, longer intervention durations, and compare them with other non-pharmacological methods

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