



RESEARCH ARTICLE

The Influence of Dysmenorrhea Exercise on the Reduction of Menstrual Pain Levels (Dysmenorrhea)

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Abstract

Dysmenorrhea is commonly experienced by women with a menarche age of ≤ 12 years, accounting for 83.7%. The prevalence of dysmenorrhea among adolescents ranges from 43% to 93%, with about 74-80% experiencing mild dysmenorrhea. One form of exercise that can be utilized to alleviate menstrual pain is dysmenorrhea exercise. This study aims to determine the effect of dysmenorrhea exercise on reducing menstrual pain levels (dysmenorrhea) among female students at SMK YP 17 Baradatu in 2022. This research is a quantitative study using a pre-experimental design and a one-group pretest-posttest approach. The population of this study was all female students of class X at SMK YP 17 Baradatu, totaling 79 individuals, with a sample of 15. The sampling technique employed was purposive sampling. Data analysis was conducted using the Wilcoxon test. The results showed that the average menstrual pain level before performing dysmenorrhea exercise was 4.33, and after the exercise, the average was reduced to 1.47. The bivariate analysis indicated a significant influence of dysmenorrhea exercise on the reduction of menstrual pain levels (dysmenorrhea) among the female students at SMK YP 17 Baradatu in 2022, with a p-value of 0.001. It is expected that students can apply dysmenorrhea exercise when experiencing menstrual pain and can teach it to their peers who suffer from menstrual pain.

Keywords: Dysmenorrhea Exercise, Menstrual Pain, Gymnastics

Abstrak: Dismenore banyak dialami pada wanita dengan usia menarche ≤ 12 tahun yaitu sebanyak 83,7%. Prevalensi kejadian dismenore pada remaja berkisar antara 43% hingga 93%, dimana sekitar 74-80% remaja mengalami dismenore ringan. Salah satu olahraga yang dapat digunakan untuk mengatasi nyeri haid adalah dengan senam dismenorea. Tujuan penelitian ini untuk mengetahui pengaruh senam dismenore terhadap penurunan tingkat nyeri haid (dismenore) pada remaja putri di SMK YP 17 Baradatu tahun 2022. Jenis penelitian ini adalah penelitian kuantitatif yaitu dengan rancangan pre-experiment dan pendekatan one group pretest and posttest design. Populasi dalam penelitian ini adalah seluruh siswi kelas X SMK YP 17 Baradatu dengan jumlah 79 orang dengan sampel 15 orang. Teknik sampel yang digunakan yaitu purposive sampling. Analisis data menggunakan wilcoxon. Hasil penelitian ini menunjukkan bahwa rata-rata nyeri haid sebelum melakukan senam dismenore pada remaja putri adalah 4,33 dan setelah dilakukan senam dismenore didapatkan rata-rata 1,47. Hasil analisis bivariat didapatkan ada pengaruh senam dismenore terhadap penurunan tingkat nyeri haid (dismenore) pada remaja putri di SMK YP 17 Baradatu tahun 2022 dengan p value 0,001. Diharapkan siswi dapat menerapkan senam dismenore saat mengalami nyeri dismenore, serta dapat mengajarkan kepada teman-temannya yang mengalami nyeri haid.

Kata kunci: Senam Dismenore dan Nyeri Haid, Gymnastics

INTRODUCTION

Dysmenorrhea is a common health issue with a high prevalence worldwide, including in Indonesia, affecting the quality of life and requiring effective management. Until now, pharmacological treatment has often been the primary choice; however, non-pharmacological therapy, such as dysmenorrhea exercise, offers a lower-risk alternative with additional health benefits.

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Adolescence is a transition period from childhood to adulthood, marked by an acceleration of physical, emotional, mental, and social development. Significant physical changes experienced by adolescents have a profound impact on their psychological development, including body growth with an increase in height and the commencement of reproductive organ function, indicated by menstruation in females. This period often comes with disorders during menstruation, such as menstrual pain or dysmenorrhea.

Dysmenorrhea is caused by an excess of prostaglandin $F2\alpha$ in menstrual blood, stimulating uterine hyperactivity, resulting in muscle spasms. The incidence of dysmenorrhea is substantial worldwide. Over 50% of women in every country experience menstrual pain. In America, the percentage is around 60%, and in Sweden, about 72%, while data in Indonesia show an incidence rate of 64.25%, consisting of 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea.

Dysmenorrhea is prevalent in women with a menarche age of ≤ 12 years, amounting to 83.7%, and the majority experience menstruation lasting ≥ 7 days, at 87.2%. The prevalence of dysmenorrhea among adolescents ranges from 43% to 93%, with about 74-80% experiencing mild dysmenorrhea. One cause of dysmenorrhea is endometriosis, with an incidence of 25-38% in adolescents, while in those not responding positively to treatment for menstrual pain, endometriosis is found in 67% of cases.

There are several risk factors influencing the occurrence of primary dysmenorrhea, including early menarche at an age <11 years, infrequent or no exercise, longer-than-normal menstrual cycles and duration (over 7 days), family history, stress, and other habits such as consuming junk food or fast food, smoking, and alcohol consumption. Additionally, indirect factors causing dysmenorrhea include a person's education and knowledge.

Menstrual pain is a normal occurrence, yet it can become severe if influenced by psychological and physical factors such as stress, shock, vasoconstriction, chronic diseases, anemia, and declining physical condition. Moreover, dysmenorrhea significantly impacts adolescent girls by disrupting daily activities, particularly school learning activities. Girls experiencing dysmenorrhea during menstruation feel limited in their activities, especially academic learning.

Learning activity involves an individual's engagement in attitudes, thoughts, and attention in learning activities, supporting the success of the teaching and learning process to benefit from these activities. Girls suffering from menstrual pain (dysmenorrhea) while participating in learning activities can lead to disrupted learning, lack of enthusiasm, and decreased concentration, making it difficult to absorb the material presented and sometimes resulting in school absences.

Treatment for menstrual pain consists of pharmacological and non-pharmacological therapies. Pharmacological treatment can involve the consumption of analgesic drugs. Common non-pharmacological treatments to reduce menstrual pain include herbal medicine, supplements such as vitamin E, acupuncture, hypnotherapy, relaxation, and exercise. Exercise therapy can alleviate dysmenorrhea in several ways, such as reducing stress, mitigating menstrual symptoms by enhancing local metabolism, and increasing local blood flow in the pelvis. Additionally, dysmenorrhea exercise can increase the production of endorphins.

One type of exercise to address menstrual pain is dysmenorrhea exercise, which can facilitate blood flow in the muscles around the uterus, thus reducing or alleviating

pain. The movements consist of muscle loosening and stretching.

This study aims to provide new insights into non-pharmacological interventions in managing dysmenorrhea. By exploring the effectiveness of dysmenorrhea exercise, this research contributes to adolescent health practices and education by offering an alternative to overcome menstrual pain that can interfere with learning activities.

Understanding that adolescent girls need practical and safe solutions to address dysmenorrhea, this study is crucial for increasing awareness and knowledge about the benefits of dysmenorrhea exercise. It will support efforts to reduce school absences and improve concentration and academic performance among adolescent girls during their menstrual period.

The purpose of this research is to test the extent to which dysmenorrhea exercise can reduce menstrual pain levels in adolescent girls. By providing empirical evidence of the benefits of dysmenorrhea exercise, this study seeks to offer recommendations for adolescent health education and dysmenorrhea management strategies in schools.

MATERIAL AND METHODS

Research Design

This study adopted a quantitative design with a pre-experimental model to assess the influence of dysmenorrhea exercise on the level of menstrual pain among adolescent girls. Specifically, it utilized a "one group pretest-posttest design," where data were collected before and after the intervention on the same group without a control group.

Population and Sample

The study population included all female students in grade X at SMK YP 17 Baradatu, totaling 79 individuals. From this population, 15 students were selected as the sample through purposive sampling, considering specific inclusion and exclusion criteria such as the frequency and intensity of menstrual pain experienced.

Inclusion and Exclusion Criteria

The inclusion criteria for sample selection encompassed students experiencing primary dysmenorrhea, aged between 15-18 years, and willing to participate in all dysmenorrhea exercise sessions. The exclusion criteria included students with certain medical conditions that could affect pain sensation or those currently undergoing pharmacological therapy for dysmenorrhea.

Intervention

The intervention in this study was dysmenorrhea exercise, conducted according to a standard protocol designed to reduce menstrual pain. The exercise was performed twice a week for one menstrual cycle. Trained instructors led the sessions, and adherence to the exercise was recorded.

Data Collection

Data were collected using a quantitative pain scale such as the Numeric Pain Rating Scale to assess the level of menstrual pain before and after the intervention.

Respondents completed the scale immediately before starting the intervention and after the first menstrual cycle following the intervention.

Data Analysis

Data were analyzed using the non-parametric Wilcoxon Signed Rank Test to compare pain scores before and after the intervention. This analysis was chosen considering the unknown data distribution and the relatively small sample size. The statistical significance level was set at $p < 0.05$.

Research Ethics

This research received ethical approval from the relevant ethics committee, and each participant provided informed consent before joining the study. Privacy and

confidentiality of participant information were ensured throughout the research process.

RESULTS AND DISCUSSION

The results indicate that the average menstrual pain before performing dysmenorrhea exercise was 4.33 with a standard deviation of 0.900, a minimum pain score of 3, and a maximum of 6. Dysmenorrhea is a symptom, not a disease. Its manifestations include pain in the lower abdomen. In certain cases, the pain can be felt around the pelvis and inner thighs, particularly on the first and second days of menstruation. Its causes vary from increased prostaglandins to hormonal changes. Based on its etiology, menstrual pain is differentiated into two types: primary and secondary dysmenorrhea (Oktasari, 2015).

Table 1
Average menstrual pain before performing dysmenorrhea exercise among adolescent girls

Menstrual Pain	N	Mean	Standard Deviation	Min-Max
Before performing dysmenorrhea exercise	15	4,33	0,900	3-6

Pain is an unpleasant sensory and emotional experience resulting from actual or potential tissue damage. Pain scales are divided for patients with verbal ability who can self-report their pain. Dysmenorrhea usually occurs during the premenstrual phase (secretion). In this phase, there is an increase in prolactin and estrogen hormones. In line with its nature, prolactin can increase uterine contractions. Hormones also involved in dysmenorrhea include prostaglandins (Manuaba, 2015).

Dysmenorrhea typically occurs due to the excessive release of a particular prostaglandin, Prostaglandin-F2 alpha, from the endometrial cells of the uterus. Prostaglandin-F2 alpha is a potent stimulant of smooth muscle contractions in the myometrium and constriction of

uterine blood vessels. This exacerbates the normal menstrual uterine hypoxia, leading to severe pain (Manuaba, 2015).

This study aligns with research conducted by Astuti et al. (2021), which showed that the average level of menstrual pain among respondents before being given dysmenorrhea exercise intervention was 6.73 with a standard deviation of 0.961.

According to the researcher's hypothesis, dysmenorrhea is a pain in the lower abdomen experienced during the menstrual cycle, felt primarily on the first and second days of menstruation. Dysmenorrhea pain needs to be effectively managed to not interfere with daily activities before or during menstruation.

Table 2
Average menstrual pain after performing dysmenorrhea exercise among adolescent girls at SMK YP 17 Baradatu in 2022

Menstrual Pain	N	Mean	Standard Deviation	Min-Max
After performing dysmenorrhea exercise	15	1,47	1,060	0 - 3

The results show that the average menstrual pain after performing dysmenorrhea exercise was 1.47 with a standard deviation of 1.060, a minimum pain score of 0, and a maximum of 3. Dysmenorrhea exercise is one form of relaxation highly recommended. The purpose of conducting dysmenorrhea exercise is to reduce dysmenorrhea experienced by some women each month (Suparto, 2015). This is because when exercising or doing gymnastics, the body produces the hormone endorphin. Endorphins are produced by the brain and spinal cord nervous system. This hormone acts as a natural tranquilizer produced by the brain, creating a sense of comfort (Haruyama, 2014). Regularly exercising athletes have a lower prevalence of dysmenorrhea compared to obese women and women with irregular menstrual cycles (Laila, 2015).

This study is in line with research by Nurfiana et al. (2021), which indicated that the average level of dysmenorrhea after performing dysmenorrhea exercise was

1.73. Supported by research from Marlinda (2013) on adolescent girls in Sidoharjo Village, Pati District, it showed that the intensity of pain among the adolescents before exercise was mostly moderate (65%) and after exercise mostly decreased to mild (70.0%).

According to the researcher's assumption, dysmenorrhea exercise is effective in reducing the pain felt during menstruation. This is because exercise can increase the number and size of blood vessels distributing blood throughout the body. Therefore, exercise is important for adolescent girls experiencing dysmenorrhea because moderate and regular training will increase the release of beta-endorphins (natural pain relievers) into the bloodstream, thereby reducing menstrual pain or dysmenorrhea.

Table 3
The influence of dysmenorrhea exercise on the reduction of menstrual pain levels (dysmenorrhea) among adolescent girls

Menstrual Pain	N	Mean	P value
Before performing dysmenorrhea exercise	15	4,33	0,001
After performing dysmenorrhea exercise	15	1,47	

The results of this study show that the average menstrual pain before performing dysmenorrhea exercise was 4.33, which decreased to an average of 1.47 after the exercise. The Wilcoxon test results yielded a p value of 0.001 < 0.05, indicating that there is a significant effect of dysmenorrhea exercise on the reduction of menstrual pain levels (dysmenorrhea) among adolescent girls at SMK YP 17 Baradatu in 2022.

This study aligns with the theory that dysmenorrhea exercise is a highly recommended form of relaxation. The purpose of performing dysmenorrhea exercise is to reduce the dysmenorrhea experienced by some women each month (Suparto, 2015). This occurs because, during exercise or gymnastics, the body produces the hormone endorphin. Endorphins are generated by the brain and spinal cord nervous system and act as a natural tranquilizer produced by the brain, thereby inducing a sense of comfort (Haruyama, 2014).

Dysmenorrhea exercise is one relaxation technique that can produce the hormone β -endorphin, which is produced by the brain and spinal cord nervous system. Dysmenorrhea exercise consists of light physical activities beneficial in reducing dysmenorrhea (Laila, 2015).

The goal of performing dysmenorrhea exercise is to lessen the severity of dysmenorrhea pain. Its benefits include improving fitness, optimizing cognitive function, enhancing mental and physical relaxation, promoting body awareness development, reducing muscle tension (cramps), alleviating muscle pain, and reducing pain during menstruation (dysmenorrhea) (Laila, 2015).

Regular exercise, taking into account continuity and the appropriate frequency—ideally five times, a week before the next menstruation, and the correct duration, about 30 minutes for each session—will yield numerous benefits for the body. One of the benefits of dysmenorrhea exercise is the reduction or even elimination of pain experienced before menstruation (Susanti, 2017).

This study is consistent with the research conducted by Kumalasari (2017), which showed that regular dysmenorrhea exercise performed in the evenings before the menstrual cycle could reduce the level of menstrual pain. The average level of menstrual pain decreased by 4.006. Research in Indonesia found the highest average reduction in menstrual pain to be 3.733 with a p value of 0.000, and studies from abroad reported the most significant decrease in menstrual pain levels to be 29.36 with a p value of 0.002.

Supported by research from Novadela (2017), the analysis showed a p value of 0.000 ($p < 0.05$), indicating a very significant change in dysmenorrhea levels before and after dysmenorrhea exercise among adolescents who received dysmenorrhea exercise therapy.

According to the researcher's hypothesis, the change in pain levels is not solely due to the exercise itself but can also be attributed to other factors such as the frequency, continuity, and duration of the exercise, with each component movement in the warm-up, core, and cooldown phases. The more frequent the exercise, the higher the levels of β -endorphin. When someone exercises, β -endorphin is released and captured by receptors in the hypothalamus and limbic system, which regulate emotions. An increase in

β -endorphin is closely related to pain reduction; the body can create a feeling of comfort and pleasure, thus decreasing the pain experienced.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this study, it can be concluded that the average menstrual pain before performing dysmenorrhea exercise among adolescent girls was 4.33, and after performing dysmenorrhea exercise, the average was reduced to 1.47. The bivariate analysis showed a significant effect of dysmenorrhea exercise on the reduction of menstrual pain levels (dysmenorrhea) among the adolescent girls at SMK YP 17 Baradatu in 2022, with a p value of 0.001.

It is hoped that students can apply dysmenorrhea exercise when experiencing dysmenorrhea pain and can teach it to their friends who suffer from menstrual pain.

DECLARATIONS

Consent For Publication

I fully agree that this thesis can be published for academic purposes and I am ready to provide support and additional information needed to facilitate the publication process.

Availability Of Data And Material (ADM)

All of the data and materials used in this research have been collected well and are available for those who need them, both for academic purposes and further research.

Competing Interests

The authors declare no conflict of interest.

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In this research process, the researcher used personal funds to support the continuity of the research.

Authors' Contributions

The author's contributions to this research include planning, data collection, analysis, and report writing. All of these contributions would not have been possible without the support of the parties who have assisted in the research process.

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