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Aerobic Exercise to Overcome Menstrual Pain in Adolescent Girls at Gemayasih Islamic Boarding School

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Abstract

This study investigated the effectiveness of aerobic exercise in reducing menstrual pain among adolescent girls at Gemayasih Islamic Boarding School. Using a quasi-experimental design with pre-test and post-test measurements, 50 adolescent girls aged 14-17 years were divided into two groups: an intervention group performing aerobic exercise (n=28) and a control group performing jogging (n=22). Pain intensity was measured using the Numeric Rating Scale (0-10) over three menstrual cycles. Results showed that the aerobic exercise group experienced a more significant reduction in pain intensity (from 3.50 ± 0.600 to 1.20 ± 0.300) compared to the jogging group (from 3.60 ± 0.650 to 2.50 ± 0.600). Statistical analysis revealed a significant difference between the groups (p=0.000), with aerobic exercise demonstrating superior effectiveness in pain reduction. The study also found that participants commonly experienced additional symptoms, with emotional instability being the most prevalent (97% in the aerobic group, 90% in the jogging group). These findings suggest that aerobic exercise can serve as an effective non-pharmacological intervention for managing menstrual pain in adolescent girls within boarding school settings.

Keywords: Aerobic exercise, menstrual pain, dysmenorrhea, adolescent girls, Islamic boarding school

1. Introduction

Menstrual pain or dysmenorrhea is a common health issue that affects a large percentage of adolescent girls worldwide (Drejza et al., 2024). This pain, typically experienced as cramps in the lower abdomen, often disrupts daily activities and can be accompanied by symptoms like nausea, dizziness, and fatigue. For many young women, dysmenorrhea begins with the onset of menstruation and may persist through adolescence and into adulthood (Friedrichsdorf et al., 2016).

In Indonesia the prevalence of menstrual pain among adolescent girls is significant. Recent studies show that more than half of Indonesian adolescent girls experience some level of menstrual discomfort, with pain severity ranging from mild to debilitating (Anita & Oktavia, 2023). Conventional approaches to managing menstrual pain often involve pharmacological treatments, particularly nonsteroidal anti-inflammatory drugs (NSAIDs), which help alleviate inflammation and pain (Oladosu et al., 2018). Overreliance on medication can lead to long-term side effects, prompting the need for alternative, non-pharmacological solutions for pain management.

One effective non-pharmacological approach to reducing menstrual pain is regular exercise, particularly aerobic exercise (Armour et al., 2019). Koman et al., (2024) research shows that physical activity, including aerobic exercise, increases blood circulation, reduces muscle tension, and boosts endorphin levels in the body. Endorphins act as natural painkillers, which help alleviate pain and improve mood (Pahlavani, 2023). Aerobic exercise, specifically, is an accessible and cost-effective method that adolescent girls can perform regularly to manage their menstrual pain and improve overall well-being (Purwanti et al., 2016).

Beyond pain relief, aerobic exercise can improve emotional resilience and mental clarity, which are beneficial for young women balancing educational responsibilities (Belcher et al., 2021). In structured environments like boarding schools, aerobic exercise may be particularly valuable in helping students manage their symptoms and maintain focus on academic and extracurricular activities (Wahab et al., 2013).

Limited research has been conducted in Indonesia on the effectiveness of aerobic exercise in relieving menstrual pain in adolescent girls, particularly within boarding school environments. The routines, activities, and cultural practices in Indonesian boarding schools may influence how students experience and manage menstrual pain, making

it crucial to investigate the benefits of aerobic exercise in this specific context. Understanding how aerobic exercise can serve as a practical solution to menstrual pain within a boarding school setting would provide valuable insights and potential health interventions for Indonesian adolescent girls.

This study aims to investigate the effects of aerobic exercise on menstrual pain in adolescent girls at Gemayasih Islamic Boarding School. By comparing pain intensity before and after a structured aerobic exercise intervention, this research seeks to assess the effectiveness of aerobic exercise as a non-pharmacological intervention. A control group performing jogging exercises will be used to compare outcomes and determine if aerobic exercise provides superior pain relief.

2. Methodology

This study used a quasi-experimental design with a pre-test and post-test approach to investigate the effect of aerobic exercise on menstrual pain in adolescent girls at Gemayasih Islamic Boarding School. The sample consisted of 50 adolescent girls selected by purposive sampling and met the inclusion criteria:
(1) willing to be respondents,
(2) aged 14 – 17 years,
(3) having regular menstrual cycles (21 – 35 days),
(4) experiencing primary dysmenorrhea with mild to severe pain intensity (pain scale 0 – 10).

Respondents were divided into two groups, 28 respondents in the intervention group (aerobic exercise) and 22 respondents in the group. Intervention and Research Procedure Before the intervention, both groups were given a pre-test to measure the intensity of menstrual pain using the Numeric Rating Scale (NRS) with a scale of 0–10, where 0 means no pain and 10 means the worst pain. Data Collection and Analysis Data were collected through pain scale measurements before (pre-test) and after the intervention for three menstrual cycles (post-test). The Kolmogorov-Smirnov normality test was used to determine the distribution of data. Furthermore, analysis using the Wilcoxon test was carried out to see the difference in pain scales before and after the intervention in each group. In addition, the Mann-Whitney test was used to compare the effectiveness of aerobic exercise and jogging in reducing pain intensity.

3. Results and Discussion

Figure 1: Aerobic exercise activity

This activity is aerobic exercise held at Gemayasih Islamic Boarding School, especially for young women as part of a program to overcome menstrual pain. Aerobic exercise was chosen because this physical activity has been proven to help reduce menstrual pain or dysmenorrhea that is often experienced by young women.

Table 1: Respondent Characteristics Based on Age, Menarche, Menstrual Duration, and How to Deal with Pain

Characteristics	Aerobics (n = 28)	Jogging (n = 22)
Age (Mean ± SD)	14.2 ± 1.820	14.1 ± 1.130
Menarche (Mean ± SD)	11.7 ± 0.660	11.5 ± 1.230

Menstrual Period (days)	6.6 ± 0.590	7.1 ± 0.590
Other Symptoms Besides Pain		
Unstable emotions (%)	97	90
Dizzy (%)	55	65
Diarrhea (%)	18	20
How to Deal with Pain		
Left alone (%)	10	15
Warm compress (%)	78	58
Pain reliever (%)	25	30
Abdominal massage (%)	10	10
Visiting health services (%)	82	50

Table 1 shows the characteristics of respondents based on age, age of menarche, duration of menstruation, and methods used to overcome pain. The average age of respondents in both groups was almost the same, which was around 14 years. The average age of menarche was slightly higher in the aerobic exercise group (11.7 years) compared to the jogging group (11.5 years). The duration of menstruation was slightly shorter in the aerobic exercise group (6.6 days) compared to the jogging group (7.1 days). Both groups showed additional symptoms besides pain, with the highest proportion of symptoms of emotional instability, which was 97% in the aerobic exercise group and 90% in the jogging group. Most respondents in the aerobic exercise group overcome pain with warm compresses (78%), while the jogging group used the same method more but with a lower percentage (58%). This shows that most adolescents prefer non-pharmacological methods such as warm compresses to reduce menstrual pain.

Table 2: Pain Intensity Before and After the Procedure

Group	Mean ± SD	Range	P-Value
Intervention Group (Aerobic Exercise)			0.000
Before	3.50 ± 0.600		
After	1.20 ± 0.300	01-Feb	
Control Group (Jogging)			0.000
Before	3.60 ± 0.650	02-Apr	
After	2.50 ± 0.600	01-Mar	

Table 2 shows the pain intensity before and after the intervention in the aerobic exercise group and the jogging group. In the aerobic exercise group, the average pain intensity before the intervention was 3.50 and decreased to 1.20 after the intervention. The decrease in pain in this group indicates the effectiveness of aerobic exercise in reducing menstrual pain. Meanwhile, in the jogging group, the average pain intensity before the intervention was 3.60 and decreased to 2.50 after the intervention. Although jogging was also able to reduce pain, the pain reduction in the jogging group was not as effective as in the aerobic exercise group. The p-value of 0.000 in both groups indicates that the change in pain intensity before and after the intervention was statistically significant, indicating that both aerobic exercise and jogging can reduce menstrual pain in adolescent girls.

Table 3: Differences in Pain Intensity in the Intervention and Control Groups

Pain Intensity	Mean Rank	P-Value
Aerobics	36.50	0.000
Jogging	16.00	

Table 3 shows the difference in pain intensity between the aerobic exercise intervention group and the jogging control group. The aerobic exercise group had a mean rank of 36.50, while the jogging group had a mean rank of 16.00. A p-value of 0.000 indicates that the difference in pain intensity between the two groups is significant. This indicates that aerobic exercise is more effective in reducing menstrual pain than jogging. Aerobic exercise is believed to increase the production of endorphins which act as natural analgesics, thus reducing pain more significantly. On the other hand, although jogging can also reduce pain, its effectiveness is not as great as aerobic exercise. These results support the use of aerobic exercise as an effective non-pharmacological method to overcome menstrual pain in adolescent girls.

4. Conclusion

This study showed that aerobic exercise intervention was significantly more effective in reducing menstrual pain than jogging in adolescent girls with primary dysmenorrhea. Before the intervention, the average pain intensity in the aerobic exercise group was 3.50 ± 0.600, while in the jogging group it was 3.60 ± 0.650. After the intervention, the pain intensity in the aerobic exercise group decreased to 1.20 ± 0.300, while in the jogging group it decreased to 2.50 ± 0.600. The results of the statistical test showed a significant difference with a p-value of 0.000, indicating that aerobic exercise is more effective than jogging in reducing pain.

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