Contents lists available atIOCS

Science Midwifery

journal homepage:www.midwifery.iocspublisher.org

The effect of abdominal stretching on pain intensity in adolescent girl for managing dysmenorrhea at SMAN 1 Penawartama, Tulang Bawang Regency, Lampung Province, 2024

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ARTICLE INFO

Article history:

Received Jun 16, 2025
Revised Jun 24, 2025
Accepted Jun 30, 2025

Keywords:

Abdominal Stretching
Adolescent Girls
Dysmenorrhea
Menstrual Pain

ABSTRACT

Dysmenorrhea is a common complaint frequently experienced by adolescent girls, which may negatively impact daily activities and quality of life. This study aims to determine the effect of abdominal stretching on menstrual pain intensity in adolescent girls. A quasi-experimental method was employed with a pretest-posttest design without a control group. The study population consisted of 88 students from grades X and XI at SMAN 1 Penawartama, with 42 respondents selected using purposive sampling. Data were collected through observation and interviews using a numerical pain scale. The findings revealed that the average pain intensity before abdominal stretching was 3.00, which decreased to 1.00 after the intervention. The Wilcoxon test produced a p-value of 0.000, indicating a significant effect of abdominal stretching in reducing menstrual pain. These results suggest that abdominal stretching can be a practical, non-pharmacological alternative therapy that is easily applied independently by adolescents. The study recommends the incorporation of abdominal stretching exercises in school physical education curricula or adolescent reproductive health programs.

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INTRODUCTION

Adolescence is a critical developmental phase characterized by significant physical, emotional, and social changes, including the onset of menstruation in females (Kependudukan & Nasional, 2023). One prevalent reproductive health issue among adolescent girls is dysmenorrhea—menstrual pain

that may significantly disrupt daily functioning, academic concentration, and quality of life (Desi, 2021)(Hayati & Agustin, 2020).

Primary dysmenorrhea is caused by uterine muscle contractions triggered by elevated prostaglandin levels resulting from decreased estrogen and progesterone levels before menstruation (FATIMAH, 2024). According to the (Bull et al., 2020), approximately 50% of adolescent females globally experience primary dysmenorrhea, with the incidence rate in Indonesia reaching 54.89% (Kemenkes, 2019). Specifically, in Lampung Province, the prevalence stands at 54.9% (Lampung Provincial Health Office, 2020). If inadequately managed, this condition may lead to diminished academic performance and increased risk of complications such as endometriosis and infertility (Janssen et al., 2013).

While pharmacological management—such as non-steroidal anti-inflammatory drugs (NSAIDs)—is commonly used, prolonged use may lead to side effects including gastrointestinal disturbances, hepatotoxicity, and renal dysfunction (Ningsih, 2011). Consequently, non-pharmacological interventions are increasingly explored as safer alternatives (H. P. Sari et al., 2023). One such approach is abdominal stretching—exercises aimed at relaxing the uterine muscles and improving blood circulation to reproductive organs (Tirtana et al., 2018).

Abdominal stretching has demonstrated effectiveness in reducing menstrual pain through enhanced endorphin release and reduced prostaglandin secretion (Prastiwi et al., 2021)(Yuliani et al., 2023). Several studies, including those by (Noorma, 2024)(Ardiani & Sani, 2020) have reported statistically significant reductions in pain intensity following the application of abdominal stretching ($P < 0.05$ in Wilcoxon test results).

Despite its proven benefits, this therapeutic approach remains underutilized in school settings. Preliminary findings at SMAN 1 Penawartama indicated that of the 88 surveyed female students, 42 reported experiencing dysmenorrhea, yet 39 of them had never received any education regarding abdominal stretching. This underscores the need for promotive and preventive interventions within educational environments to enhance adolescent reproductive health.

Based on this background, the present study aims to evaluate the effect of abdominal stretching on dysmenorrhea intensity among female students at SMAN 1 Penawartama. The study is expected to offer a safe, cost-effective alternative for dysmenorrhea management and to contribute to innovative practices in adolescent reproductive health education.

RESEARCH METHODOLOGY

This study employed a quantitative approach with a quasi-experimental method using a pretest-posttest design without a control group. Data collection was conducted through interviews and observation sheets. The study was carried out in April 2024 at SMAN 1 Penawartama, Tulang Bawang Regency, Lampung Province.

The study population consisted of 88 female students from grades X–XI, and 42 of them who experienced dysmenorrhea were selected through purposive sampling. The research procedure included preparation, implementation, and evaluation stages. Data were analyzed univariately and bivariately using the Wilcoxon Signed Rank Test to determine differences in pain intensity before and after the abdominal stretching intervention.

RESULT AND DISSCUSION

Result

Univariate Analysis

a. The average intensity of dysmenorrhea pain before abdominal stretching among adolescent girls at SMAN 1 Penawartama, Tulang Bawang Regency, Lampung Province, in 2024.

Table 1. Average intensity of dysmenorrhea pain before abdominal stretching

Variable	Total	Measurement	Median	Std Deviation	Min	Max
Pain Intensity	42	Pre-test	3.00	0.821	2	1

Based on Table 1, the average intensity of dysmenorrhea pain among 42 adolescent girls at SMAN 1 Penawartama before performing abdominal stretching was 3.00, classified as mild pain, with a standard deviation of 0.821. The minimum value was 2 (mild pain), and the maximum value was 4 (moderate pain).

b. The intensity of dysmenorrhea pain after abdominal stretching among adolescent girls at SMAN 1 Penawartama, Tulang Bawang Regency, Lampung Province, in 2024.

Table 2. Average intensity of dysmenorrhea pain after abdominal stretching

Variable	Total	Measurement	Median	Std Deviation	Min	Max
Pain Intensity	42	Post-test	1.00	0.477	1	2

Based on Table 2, the average intensity of dysmenorrhea pain among 42 adolescent girls at SMAN 1 Penawartama after performing abdominal stretching was 1.00, within the mild pain category, with a standard deviation of 0.477. The minimum value was 1 (mild pain), and the maximum was 2 (mild pain).

Normality Test

Table 3. Kolmogorov–smirnov normality test

Pain Intensity	Statistic	df	Sig
Before	0.246	42	0.000
After	0.424	42	0.000

Based on Table 3, the normality test results showed P: 0.000 (P < 0.005), indicating that the data distribution is not normal. Therefore, a non-parametric statistical test, namely the Wilcoxon test, was used.

Bivariate Analysis

Table 4. The effect of abdominal stretching on pain intensity among adolescent girls in managing dysmenorrhea

Pain Intensity	Ranks	N	Mean Rank	Sum of Ranks	P-Value
After	Negative Ranks	41[a]	21.00	861.00	0,000
Before	Positive Ranks	0[b]	0.00	0.00	
	Ties	1[c]			
	Total	42			

Based on Table 4, among 42 respondents, 41 experienced reduced pain intensity after abdominal stretching compared to before, and 1 respondent reported the same pain intensity before and after abdominal stretching. The result of the non-parametric statistical test using the Wilcoxon method showed a P-value: 0.000 (P < 0.005), indicating statistical significance.

Disscusion

The results demonstrate a significant reduction in dysmenorrhea pain intensity following the implementation of abdominal stretching. The average pre-intervention pain level was 3.00, decreasing to 1.00 post-intervention, with a p-value of 0.000 (<0.05). This finding confirms the efficacy of abdominal stretching in alleviating menstrual pain among adolescent girls (AMELIA MAHARANI, 2023)(SALSABILA, 2024)(Abadiah et al., 2025). It supports Harahap et al. (2023)(M. Sari, 2024)(Hafid, 2023), who noted that abdominal stretching increases beta-endorphin release, producing a physiological analgesic effect.

This form of exercise reduces pain through muscle relaxation and improved blood

circulation in the pelvic area. Prostaglandin levels—major contributors to uterine contractions and menstrual pain—can be suppressed through increased progesterone levels stimulated by regular physical activity. Stretching also relaxes abdominal and pelvic muscles while enhancing tissue oxygenation. Gusti Handayani et al. (2023) explained that such exercise controls prostaglandin secretion and prevents excessive uterine contractions.

Psychologically, abdominal stretching also yields positive effects. Adolescents with dysmenorrhea often experience discomfort, fatigue, and difficulty concentrating (Aprilia et al., 2022)(SALSABILA, 2024). Regular stretching not only reduces pain but also improves mood and academic focus, enhancing quality of life and school productivity (RISKHA, 2024)(Febri, 2024). (Armour et al., 2019) indicated that dysmenorrhea-related disturbances may lead to school absenteeism and reduced academic performance.

Abdominal stretching is considered a safe, affordable, and practical non-pharmacological approach. Its effectiveness has been validated in several studies, including Faridah et al. (2019), Ardiani & Sani (2020), and (Tangko, 2024)(W. P. Sari et al., 2018), all of which reported significant pain reduction following the intervention. Therefore, this technique is highly recommended for inclusion in physical education or adolescent reproductive health programs. Combining it with breathing relaxation may further enhance its therapeutic impact.

However, some participants did not experience a significant pain reduction. This could be due to improper technique, lack of motivation, or irregular practice. Individual pain responses also vary depending on stress levels, lifestyle, and hormonal factors. Thus, continuous education is necessary to ensure adolescents can perform the exercises correctly and independently.

CONCLUSION

The average intensity of dysmenorrhea pain among adolescent girls before performing abdominal stretching was 3.00, classified as mild pain intensity. The average intensity of dysmenorrhea pain among adolescent girls after performing abdominal stretching was 1.00, also classified as mild pain intensity. Statistically, there was a decrease in the average pain intensity from 3.00 before abdominal stretching to 1.00 after the intervention.

However, in terms of category, both are still within the mild pain intensity classification. The results of the Wilcoxon statistical test indicate a significant effect of abdominal stretching in reducing the intensity of dysmenorrhea pain among adolescent girls at SMAN 1 Penawartama in 2024, as evidenced by the statistical analysis showing a significant result with a p-value = 0.000 ($p < 0.005$), which means there is a meaningful relationship between menstrual pain intensity before and after the intervention.

The results showed that abdominal stretching effectively reduces the intensity of dysmenorrhea pain in adolescent girls at SMAN 1 Penawartama, with an average decrease from 3.00 to 1.00 and a p-value of 0.000. This intervention can be categorized as a non-pharmacological approach that is safe, simple, and can be applied independently by adolescents. As a practical recommendation, abdominal stretching can be integrated into the educational routine at school through local content in physical education lessons or adolescent reproductive health programs.

The implementation of this program needs to be supported by training for sports teachers and school health workers so that they are able to guide students to perform the movements with the correct technique. In addition, the provision of visual education modules and digital instructional guides can improve teaching effectiveness and student engagement. For future research expansion, a follow-up study with a Randomized Controlled Trial (RCT) design involving a control group is recommended to strengthen the evidence of causality. Future studies could also include measurement of physiological biomarkers such as prostaglandin levels, beta-endorphins, or tissue oxygenation levels, to more objectively evaluate the biological response to abdominal stretching. Long-term evaluation of the effectiveness of this intervention in reducing school

absenteeism or improving academic performance is also a relevant research area to support evidence-based policies in educational settings.

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