

Effectiveness of Pelvic Rocking Exercise on Primary Dysmenorrhea among Midwifery Students

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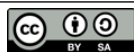
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ABSTRACT

Background: Primary dysmenorrhea is one of the most common gynecological problems experienced by women of reproductive age, characterized by spasmodic cramps and lower abdominal pain without pathological abnormalities. This condition negatively affects academic activities, productivity, and quality of life. Pelvic rocking exercise, a simple movement using a gym ball, has been suggested to improve uterine blood flow, reduce uterine muscle contractions, and stimulate endorphin release to decrease pain intensity. This study aimed to evaluate the effectiveness of pelvic rocking exercise on primary dysmenorrhea among undergraduate midwifery students. **Methods:** A quasi-experimental study with a one-group pretest–posttest design was conducted involving 18 first-year midwifery students experiencing primary dysmenorrhea, selected using accidental sampling. Pain intensity was measured before and after a 15-minute pelvic rocking exercise session and analyzed using the Wilcoxon signed-rank test. **Results:** The mean pain intensity before the intervention was 5.77 (moderate category), which decreased to 2.44 (mild category) after the intervention. The Wilcoxon test showed a p-value = 0.000 ($p < 0.05$), indicating a significant reduction in pain intensity. **Conclusion:** Pelvic rocking exercise was proven effective in reducing primary dysmenorrhea among midwifery students. It can therefore be recommended as a non-pharmacological intervention in managing menstrual pain.



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INTRODUCTION

Primary dysmenorrhea is one of the most common gynecological problems among women of reproductive age. The global prevalence ranges from 45–95%, with 2–29% experiencing severe pain, particularly in women under 24 years old (WHO, 2020; Ju et al., 2014). In Indonesia, the prevalence reaches 64.25%, consisting of 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea (Savitri, 2025). This high incidence highlights dysmenorrhea as an important reproductive health issue requiring attention.

Dysmenorrhea negatively impacts quality of life, productivity, as well as academic and occupational activities. Studies report that 14–51% of adolescents with primary dysmenorrhea experience school absenteeism, and approximately 1% of female workers lose productivity for 1–3 days each month (Rusli, 2019; Mahwish et al., 2024;

Schoep et al., 2019; De Sanctis et al., 2015). Similarly, 57.03% of medical students were reported to have academic absenteeism due to menstrual pain (Rojas & López, 2017), with severity shown to correlate positively with absenteeism frequency (Donayeva et al., 2023; Guimarães & Póvoa). Despite these impacts, many adolescents do not seek medical assistance because they consider dysmenorrhea complaints as normal (Getahun et al., 2023; Ulya Rohima, 2016; Chalise et al., 2025; Wong, 2011).

Non-pharmacological interventions are increasingly recommended for dysmenorrhea management because they are safe, have minimal side effects, and can be applied long-term. Several methods proven effective include yoga, heat therapy, acupuncture, and exercise (Wahdah, 2024; Zapata et al., 2023; Ernowati & Askar, 2024). One simple exercise is pelvic rocking using a gym ball, which has been shown to reduce pain by improving uterine blood flow, decreasing ischemia, suppressing prostaglandin release, and stimulating endorphin production (Saikia et al., 2024; Solihah et al., 2023; Utami & Utami, 2019; Yessi, 2021; Hartmann et al., 2004).

Although dysmenorrhea prevalence is relatively high among health students, studies on the effectiveness of pelvic rocking exercise in Indonesia remain limited. At STIKes RSPAD Gatot Soebroto, complementary therapy facilities are available but have not been fully optimized for adolescent reproductive health issues. To address this gap, this study was conducted to evaluate the effectiveness of pelvic rocking exercise on primary dysmenorrhea among midwifery students.

METHODS

This study employed a quasi-experimental design without a control group, using a one-group pretest–posttest approach. This design involved measuring pain intensity before and after the intervention to determine the effectiveness of pelvic rocking exercise on primary dysmenorrhea among midwifery students (Notoatmodjo, 2010).

The study was conducted at the Bachelor of Midwifery Program, STIKes RSPAD Gatot Soebroto, Central Jakarta, from December 2023 to January 2024. The study population consisted of all 51 first-year undergraduate midwifery students. Based on initial screening, 24 students were identified as experiencing primary dysmenorrhea, and 18 who met the inclusion criteria and agreed to participate were included as respondents. The inclusion criteria were: (1) active first-year midwifery students, (2) experiencing primary dysmenorrhea with regular menstrual cycles, and (3) willing to participate by signing informed consent. Exclusion criteria included: (1) students with a history of gynecological diseases such as endometriosis or ovarian cysts, (2) those undergoing long-term pharmacological therapy, and (3) absence during the intervention period. The intervention consisted of pelvic rocking exercise using a gym ball. Respondents sat on the ball with both feet on the floor, then performed rhythmic pelvic movements (forward–backward and side-to-side) for 10–15 minutes once daily during menstruation. The intervention was supervised directly by the researcher, who had received prior training in the technique.

Data were collected through demographic questionnaires and pain intensity measurements using a numeric rating scale (NRS) before and after the intervention. Data were analyzed using the non-parametric Wilcoxon signed-rank test to determine differences in pain intensity. A significance level of $p < 0.05$ was considered statistically significant. This study obtained ethical approval from the Health Research Ethics Committee of STIKes RSPAD Gatot Soebroto. All participants were informed about the study's purpose, procedures, benefits, and potential risks, and only those who

signed informed consent were included.

RESULTS

The study involved 18 first-year midwifery students who experienced primary dysmenorrhea. Pain intensity was measured before and after the pelvic rocking exercise intervention.

Table 1. Dysmenorrhea Pain Intensity Before and After the Intervention

Pain Intensity	Before Intervention n (%)	After Intervention n (%)
No Pain	0 (0.0%)	3 (17.0%)
Mild	2 (11.0%)	12 (66.0%)
Moderate	9 (50.0%)	3 (17.0%)
Severe	7 (39.0%)	0 (0.0%)

Table presents the distribution of dysmenorrhea pain intensity before and after the pelvic rocking exercise intervention. Prior to the intervention, most respondents experienced moderate pain (50%) and severe pain (39%), with only 11% reporting mild pain and none reporting no pain. After the intervention, there was a significant shift in pain categories: the majority of respondents reported mild pain (66%), followed by no pain (17%) and moderate pain (17%), while none experienced severe pain. These findings indicate that the pelvic rocking exercise was effective in reducing the intensity of menstrual pain, shifting the distribution from moderate and severe pain toward mild and no pain among first-year midwifery students.

Table 2. Mean Pain Intensity Before and After Pelvic Rocking Exercise

	Mean	N	Asymp.sig (2-tailed)
Pain Intensity Before Pelvic Rocking Exercise	5,77	18	<0.001
Pain Intensity After Pelvic Rocking Exercise	2,44	18	

Table 2 highlights the mean pain intensity scores before and after the intervention. The average pain score decreased from 5.77 (moderate pain) to 2.44 (mild pain). The statistical analysis using the Wilcoxon signed-rank test produced a p-value of <0.001 ($p < 0.05$), confirming that the reduction in pain was statistically significant.

Taken together, these results demonstrate that pelvic rocking exercise is effective in reducing primary dysmenorrhea among midwifery students. Not only did the majority of respondents experience a reduction in pain intensity, but some also reported complete relief from menstrual pain after the intervention. This finding supports the use of pelvic rocking exercise as a simple, safe, and non-pharmacological approach to managing dysmenorrhea in young women, particularly among students who often face academic and productivity challenges due to menstrual pain.

DISCUSSION

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Based on Table 2, the mean dysmenorrhea pain score before the pelvic rocking exercise was 5.77 with a standard deviation of 1.592, which falls into the moderate pain category. After the intervention, the mean pain score decreased to 2.44 with a standard deviation of 1.381, indicating a mild pain category. These findings confirm the effectiveness of pelvic rocking exercise in reducing primary dysmenorrhea among

midwifery students. This decrease is consistent with Yessi (2021), who reported mean pain scores before and after the pelvic rocking technique of 5.24 and 2.12, respectively. In that study, all respondents experienced moderate pain before the intervention, and nearly all reported mild pain after performing pelvic rocking exercise among junior high school students at SMP N 6 Lembah Gumanti (Yessi Andriani & Athica Oviana Afr, 2021).

Physiologically, the production of prostaglandins by cells in the uterine lining is the main factor causing primary dysmenorrhea. Prostaglandins trigger uterine smooth muscle contractions, and high prostaglandin levels result in stronger contractions. On the first day of menstruation, prostaglandin levels are usually very high, then decrease as the uterine lining sheds in subsequent days (Ediningtyas A, 2019). This aligns with the theory that excessive uterine contractions can cause pain when intrauterine pressure reaches 200–300 mmHg, as it reduces uterine blood flow. Exercise with a gym ball can help reduce uterine contractions by improving blood circulation (Choi JH, Lee SB, An HJ, Kim JS, Koo P, Park SY, et al., 2016).

This study also supports the theory that pelvic muscle exercises with a gym ball help the body relax, reduce stress, and relieve menstrual pain. When the body relaxes, endorphins are naturally produced. Endorphins function by inhibiting pain impulse transmission through the prevention of neurotransmitter release at the presynaptic terminal or by blocking pain signal transmission, thereby raising the pain threshold and reducing sensitivity to pain (Ratnasari NN, Pertiwi S, Khairiyah II, 2018).

Furthermore, according to Puji (2009), one effective method for managing dysmenorrhea is the pelvic rocking technique. This exercise can stimulate endorphin production in the brain and spinal cord. Activities that trigger endorphin release act as natural analgesics as well as sedatives, thereby helping to reduce pain intensity due to dysmenorrhea (Afrinita K, Novita Nesi, 2021).

Based on the results of this study, the researchers suggest that dysmenorrhea pain is triggered by uterine wall contractions induced by prostaglandins, which reduce blood and oxygen supply. Hypoxic conditions in the uterine muscles stimulate nerve endings, causing pain. Pelvic rocking movements such as rhythmic swings of the pelvis forward, backward, sideways, and circularly can help the body relax by stimulating the release of endorphins as natural analgesics while also improving uterine blood flow.

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Based on the results of this study, which demonstrated a significant reduction in pain intensity after the intervention, it can be discussed that the effectiveness of pelvic rocking exercise in reducing primary dysmenorrhea among midwifery students was evident through the shift in the mean pain score from 5.77 (moderate category) to 2.44 (mild category), with a $p\text{-value} = <0.001$ indicating a statistically significant difference. These findings are consistent with Debbarma et al. (2025), who confirmed the effectiveness of this exercise, and are further supported by Rohmah & Wijayanti (2025) and Ernawati & Askar (2024), who reported a significant reduction in pain in the intervention group compared to the control. In addition, other non-pharmacological approaches such as aerobic exercise and yoga have also been shown to effectively reduce dysmenorrhea symptoms, supporting a more holistic strategy for pain management (Wahdah, 2024). In terms of practice, pelvic rocking exercise is relatively simple, does not require special equipment, and is easy to perform, making it accessible to students (Debbarma et al., 2025), and can be taught by health professionals as a viable alternative to pharmacological treatment, which may have

side effects (Ernawati & Askar, 2024). Nevertheless, in cases of severe dysmenorrhea, pharmacological intervention is still required, highlighting the need for a balanced approach that combines pharmacological and non-pharmacological methods according to individual conditions and needs.

Comparison with Previous Studies

These findings are consistent with Ratnasari, Pertiwi, and Khairiyah (2018), who reported a Wilcoxon test p-value of 0.000, indicating that pelvic rocking significantly affected primary dysmenorrhea among eighth-grade students at MTs N 1 Pangandaran. Utami & Utami (2019) also obtained similar results with a p-value of 0.000, confirming the effectiveness of pelvic rocking in reducing dysmenorrhea pain among junior high school students at SMP Ma'arif Gamping, Yogyakarta. In addition, Puspitasari and Safitri (2020) showed that pelvic rocking therapy effectively reduced menstrual pain in adolescent girls in Leuwimalang Village, with a significance value of 0.011 (Yessi Andriani & Athica Oviana Afri, 2021).

Physiological Mechanisms

Physiologically, pelvic rocking exercise can increase blood flow to the uterus, reduce ischemia, and suppress prostaglandin release, which is the main mediator of menstrual pain (Saikia et al., 2024). Moreover, this exercise also stimulates the release of endorphins, natural analgesic hormones, which reduce pain perception by inhibiting the transmission of pain impulses in the central nervous system (Djupri et al., 2022). This is consistent with a literature review by Poppy (2022), which reported that all respondents felt more comfortable after performing pelvic rocking exercise, along with an increased estrone-to-estradiol ratio that improved uterine blood flow (Apriyanti P, Anggeriani R, 2022).

Research Implications

The effectiveness of pelvic rocking exercise is further supported by various quasi-experimental studies using pretest–posttest designs, which consistently demonstrated a reduction in pain from the moderate to mild category (Ratnasari et al., 2018; Djupri et al., 2022). These findings are also in line with meta-analyses highlighting the effectiveness of exercise interventions, including pelvic rocking, as a non-pharmacological approach to dysmenorrhea (Tsai & Chang, 2023; Anisa, 2015).

Researchers' Interpretation

According to the researchers' assumptions, the reduction in pain intensity among respondents occurred because the exercise was conducted in accordance with standard operating procedures (SOP) in a calm and spacious setting, allowing participants to feel relaxed. This relaxation helped divert attention from pain while simultaneously stimulating endorphin production, which physiologically reduces primary dysmenorrhea pain. Nevertheless, individual responses may vary depending on factors such as age, body mass index (BMI), and lifestyle. Therefore, further studies are needed to explore these variations in order to optimize the use of pelvic rocking exercise in the management of dysmenorrhea.

CONCLUSION

This study demonstrated the effectiveness of pelvic rocking exercise in reducing primary dysmenorrhea among midwifery students. The intervention significantly decreased pain intensity from the moderate to the mild category, confirming its role as a simple and safe non-pharmacological strategy for menstrual pain management.

It is recommended that pelvic rocking exercise be promoted as a complementary intervention for female students experiencing primary dysmenorrhea. Educational institutions, particularly health-related study programs, are encouraged to optimize the use of complementary therapy facilities to address adolescent reproductive health issues. Future studies with larger sample sizes and control groups are suggested to strengthen the evidence on its effectiveness and to explore influencing factors such as age, body mass index (BMI), and lifestyle.

Author's Contribution Statement: Dina Raidanti contributed to the study design, data collection, and manuscript drafting. Wahidin was involved in data analysis and interpretation of results. Siti Fathimah and Christin Jayanti contributed to the literature review, intervention assistance, and preparation as well as revision of the final manuscript. All authors have read and approved the final version of the manuscript.

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