



Effectiveness of Pelvic Rocking Exercise on Primary Dysmenorrhea among Midwifery Students

Dina Raidanti¹, Wahidin², Siti Fathimah¹, Christin Jayanti¹

¹Bachelor of Midwifery Program, STIKes RSPAD Gatot Soebroto, Jakarta, Indonesia

²Bachelor Program, Universitas Muhammadiyah Tangerang, Banten, Indonesia

 Corresponding Author: draidanti@gmail.com



ARTICLE INFO

Article History:

Received: 2025-05-13

Accepted: 2025-09-15

Published: 2025-09-30

Keywords:

Primary dysmenorrhea; Pelvic rocking exercise; Gym ball;

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 <0.001 ($p < 0.05$), 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.



©2025 by the authors. Submitted for possible open-access publication under the terms and conditions of the Creative Commons Attribution (CC BY SA) license (<https://creativecommons.org/licenses/by-sa/4.0/>)

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 (Proverawati, 2010). 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 (Gangwar et al., 2014; Gupta et al., 2024; Getahun et al., 2023; Ulya Rohima, 2016; 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; Zapala et al., 2023; Ernawati & 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 the Intervention

Pain Intensity	n	%
No Pain	0	0.0
Mild	2	11.0
Moderate	9	50.0
Severe	7	39.0

Table 1 shows the distribution of pain intensity before the pelvic rocking exercise intervention. The majority of respondents experienced moderate pain (50%), followed by severe pain (39%), while only a small proportion reported mild pain (11%). This finding indicates that most first-year midwifery students suffered from considerable menstrual pain before the intervention.

Table 2. Dysmenorrhea Pain Intensity After the Intervention

Pain Intensity	n	%
No Pain	3	17.0
Mild	12	66.0
Moderate	3	17.0
Severe	0	0.0

Table 2 presents the distribution of pain intensity after the intervention. There was a marked shift in pain categories: 66% of respondents reported mild pain, 17% reported no pain, 17% reported moderate pain, and none reported severe pain. This suggests that the pelvic rocking exercise substantially alleviated dysmenorrhea symptoms.

Table 3. 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 3 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 yielded a p-value <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

Effectiveness of Pelvic Rocking Exercise on Primary Dysmenorrhea Among Midwifery Students

Based on Table 3, 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 of 5.24 and 2.12 before and after the pelvic rocking technique, 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 Afrn, 2021).

Physiologically, prostaglandin production by cells in the uterine lining is the primary cause of 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.

Effectiveness of Pelvic Rocking Exercise on Primary Dysmenorrhea Among Midwifery Students

Based on Table 3, the Wilcoxon test yielded a p -value < 0.001 . This indicates that the reduction in pain intensity after the intervention was statistically significant. The mean pain score decreased from 5.77 (moderate category) before the intervention to 2.44 (mild category) after the intervention. These results demonstrate the effectiveness of pelvic rocking exercise in alleviating primary dysmenorrhea among midwifery students, confirming its role as a beneficial non-pharmacological intervention for menstrual pain management.

Comparison with Previous Studies

These findings are consistent with Ratnasari, Pertiwi, and Khairiyah (2018), who reported a Wilcoxon test p-value of <0.001 , 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 <0.001 , 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 stimulates the release of endorphins, natural analgesic hormones that reduce pain perception by inhibiting the transmission of pain signals 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 evidence of its effectiveness and to explore factors influencing its effectiveness, such as age, body mass index (BMI), and lifestyle.

Author's Contribution Statement: **Dina Raidanti:** Conceptualization, Methodology, Investigation, Data Curation, Writing – Original Draft. **Wahidin:** Methodology, Formal Analysis, Validation, Writing – Review & Editing. **Siti Fathimah:** Investigation, Data Curation, Writing – Review & Editing. **Christin Jayanti:** Conceptualization, Supervision, Validation, Writing – Review & Editing. All authors have read and approved the final version of the manuscript.

Conflicts of Interest: The authors declare no conflicts of interest related to this study. The authors have no financial, personal, or professional relationships with any individuals or organizations that could have inappropriately influenced the conduct, interpretation, or reporting of this research.

Source of Funding Statements: This research received no financial support or specific grant from any funding agency in the public, commercial, or not-for-profit sectors. The study was conducted independently by the authors.

Acknowledgments: The authors would like to express their sincere gratitude to STIKes RSPAD Gatot Soebroto, particularly the Bachelor of Midwifery Program, for the institutional support provided during the conduct of this study. The authors also extend their appreciation to the research team and all first-year midwifery students who participated as respondents. Special thanks are given to all individuals who provided encouragement and assistance throughout the research process.

REFERENCES

- Afrinita, K., & Novita, N. (2021). The effect of pelvic rocking exercise on primary dysmenorrhea in teenage girls. *International Journal of Medical Sciences and Public Health*, 3(5), 549. <https://jurnal.poltekkespalembang.ac.id/index.php/JMCHS/article/view/1024>
- Andriani, Y., & Afri, A. O. (2021). Teknik pelvic rocking exercise dalam penurunan intensitas nyeri dismenore remaja putri [Pelvic rocking exercise technique in reducing dysmenorrhea pain intensity among adolescent girls]. *Initium Medica Journal*, 1(3), 1–7. https://journal.medinerz.org/index_php/IMJ/article/view/81
- Choi, J. H., Lee, S. B., An, H. J., Kim, J. S., Koo, P., Park, S. Y., et al. (2016). Effects of music therapy and ball exercise on menstrual discomforts among women in their 20s. *Journal of international academy of physical therapy research*, 7(2), 1056–1065. <https://scispace.com/papers/effects-of-music-therapy-and-ball-exercise-on-menstrual-3hgi1b22lv>
- De Sanctis, V., Soliman, A. T., Bernasconi, S., Bianchin, L., Bona, G., Bozzola, M., Buzi, F., De Sanctis, C., Tonini, G., Rigon, F., & Perissinotto, E. (2015). Primary Dysmenorrhea in Adolescents: Prevalence, Impact and Recent Knowledge. *Pediatric Endocrinology Reviews*, 13(2), 512–520. <https://pubmed.ncbi.nlm.nih.gov/26841639/>
- Djupri, D., Manggabarani, S., Irawati, H. R., & Said, I. (2022). The effect of pelvic rocking exercise and Buteyko exercise on reducing primary dysmenorrhea pain levels. *Jurnal Keperawatan Padjadjaran*, 10(1). <https://doi.org/10.24198/jkp.v10i1.1938>
- Donayeva, A., Amanzholykyz, A., Abdelazim, I. A., Nurgaliyeva, R., Gubasheva, G., Saparbayev, S., Ayaganov, D., Kaldybayeva, A., & Samaha, I. (2023). The impact of primary dysmenorrhea on adolescents' activities and school attendance. *Journal of Medicine and Life*, 16, 1462–1467. <https://doi.org/10.25122/jml-2023-0247>
- Ediningtyas, A. (2019). Analisis faktor penyebab dismenore primer di kalangan mahasiswa kedokteran FK UNS [Analysis of factors causing primary dysmenorrhea among medical students at UNS]. *Jurnal Kesehatan*, 15(4), 89–92.

- Ernawati, E., & Askar, M. (2024). Efektivitas intervensi non-farmakologis dalam mengurangi nyeri haid: Sebuah studi literatur [The effectiveness of non-pharmacological interventions in reducing menstrual pain: A literature study]. *Media Kesehatan Politeknik Kesehatan Makassar*, 19(2), 296–303. <https://doi.org/10.32382/medkes.v19i2.1249>
- Gangwar, P., Anand, A., & Kaushal, P. (2014). Knowledge, attitude and practices of adolescent girls regarding dysmenorrhea in a district of Uttarakhand. *Indian Journal of Community Health*, 26(3), 298–303.
- Getahun, S., Berhe, S., Mekonnen, B., & Melaku, G. (2023). Reasons for Not Seeking Healthcare Among Students with Dysmenorrhea: A Qualitative Study. *International Journal of Women's Health*, 15, 1733–1744. <https://doi.org/10.2147/ijwh.s437233>
- Guimarães, I., & Póvoa, A. M. (2021). Primary Dysmenorrhea: Assessment and Treatment. <https://doi.org/10.6084/m9.figshare.14317167>
- Gupta, S., Sharma, R., & Verma, N. (2024). Primary dysmenorrhea and healthcare-seeking behavior among adolescent girls: A cross-sectional study. *Journal of Reproductive Health Research*, 12(1), 45–52.
- Hartmann, S., Bung, P., Schlebusch, H., & Hollmann, W. (2004). The analgesic effect of exercise during labor. *Zeitschrift Fur Geburtshilfe Und Neonatologie*, 209(4), 144–150. <https://doi.org/10.1055/S-2005-871307>
- Mahwish, N., Dube, R., Kar, S. S., Santhosh, M., Kidwai, A., & Kenneth, J. M. (2024). Prevalence and Impact of Dysmenorrhea on the Academic Performance of Students at Medical and Health Sciences University. *Emirates Medical Journal*, 05. <https://doi.org/10.2174/0102506882288695240221071629>
- Proverawati, A. (2010). *Dismenore dan penanganannya* [Dysmenorrhea and its management]. Nuha Medika.
- Ratnasari, N. N., Pertiwi, S., & Khairiyah, I. I. (2018). Pengaruh pelvic rocking exercise terhadap nyeri primary dysmenorhea pada siswi kelas VIII [The effect of pelvic rocking exercise on primary dysmenorrhea among eighth-grade students]. *Jurnal Kesehatan*, 4(2), 48–55.
- Rojas, S. C., & López, L. E. C. (2017). Asociación entre dismenorrea primaria y ausentismo académico en estudiantes de medicina de primer y segundo año de la Universidad Ricardo Palma en junio del 2016 [Association between primary dysmenorrhea and academic absenteeism among first- and second-year medical students at Ricardo Palma University in June 2016]. *Universidad Ricardo Palma Repository*. <http://repositorio.urp.edu.pe/handle/urp/1071>
- Rusli, Y., Angelina, Y., & Atma, I. (2019). Hubungan tingkat stres dan intensitas dismenore pada mahasiswa di sebuah fakultas kedokteran di Jakarta [The relationship between stress levels and dysmenorrhea intensity among female medical students in Jakarta]. *Jurnal Kesehatan*, 7(2), 122–126.
- Saikia, B., Barman, B., Kalita, L., & Saikia, K. (2024). Impact of pelvic rocking exercise on dysmenorrhea among adolescent girls. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. <https://doi.org/10.18203/2320-1770.ijrcog20241071>
- Solihah, R., Nurherliyany, M., & Sandriani, S. (2023). The Effect of Gym Ball on Reducing Low Back Pain, Labor Pain, and Progress in Primigravida Labor. *Nursing Research International*, 1(1), 30–36. <https://doi.org/10.52221/nuri.v1i1.206>
- Utami, I. P., & Utami, I. (2019). Pengaruh pelvic rocking exercise terhadap tingkat nyeri primary dysmenorhea pada siswi SMP Ma'arif Gamping Yogyakarta [The effect of pelvic rocking exercise on the level of primary dysmenorrhea pain among students of SMP Ma'arif Gamping, Yogyakarta]. *Jurnal Kesehatan*, 7(2), 1–10.
- Wahdah, R. (2024). Beyond painkillers: A meta-analysis of non-pharmacological approaches for managing dysmenorrhea symptoms. *Archives of The Medicine and Case Reports*. <https://doi.org/10.37275/amcr.v5i4.648>
- WHO. (2020). *Adolescent health and development*. World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/adolescent-health>

- Wong, L. P. (2011). Attitudes towards dysmenorrhoea, impact and treatment seeking among adolescent girls: A rural school-based survey. *Australian Journal of Rural Health*, 19(4), 218–223. <https://doi.org/10.1111/J.1440-1584.2011.01213.X>
- Yessi, A. (2021). Teknik pelvic rocking exercise dalam penurunan intensitas nyeri dismenore remaja putri [Pelvic rocking exercise technique in reducing dysmenorrhea pain intensity among adolescent girls]. *Initium Medica Journal*, 1(3), 1–7. https://journal.medinerz.org/index_php/IMJ/article/view/81
- Zapała, B., Ząber, A., Gacoń, E., Zembala, J., Siekierko, N., Kucharski, J., Żołnierrek, M., Kotusiewicz, W., & Lewandowski, M. (2023). The non-pharmacological treatment of primary dysmenorrhea: Efficiency and safety. *Journal of Education, Health and Sport*, 30(1), 79–86. <https://doi.org/10.12775/jehs.2023.30.01.007>