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THE EFFECTIVENESS OF ACUPRESSURE AND PELVIC ROCKING EXERCISE IN REDUCING DYSMENORRHEA PAIN INTENSITY AMONG ADOLESCENT GIRLS

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Abstract

Dysmenorrhea is a common gynecological condition affecting adolescents and women of reproductive age, with a prevalence ranging from 1.7% to 97% as reported by the World Health Organization (WHO). Non-pharmacological interventions, such as acupressure and pelvic rocking exercise, have been shown to reduce dysmenorrheal pain intensity. This study aimed to compare the effectiveness of acupressure and pelvic rocking exercise in reducing dysmenorrheal pain intensity among adolescent girls. A quasi-experimental study with a pretest–posttest design was conducted involving 64 respondents selected through random sampling based on predefined inclusion and exclusion criteria. Pain intensity was measured using the Numeric Rating Scale (NRS). Data were analyzed using paired sample t-tests and independent sample t-tests. The results demonstrated that both acupressure and pelvic rocking exercise significantly reduced dysmenorrheal pain intensity ($\rho<0.001$). However, no statistically significant difference was found between the two interventions ($\rho = 0.531$; $\rho> 0.05$). In conclusion, both acupressure and pelvic rocking exercise are effective in reducing dysmenorrheal pain intensity; however, neither intervention demonstrated superior effectiveness over the other.

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INTRODUCTION

Dysmenorrhea, a frequently encountered gynecological issue in adolescents and women of childbearing age, is divided into two categories: primary and secondary. Primary dysmenorrhea is characterized by lower abdominal pain that occurs before or during menstruation in the absence of identifiable organ pathology. In contrast, secondary dysmenorrhea is menstrual pain resulting from distinct pelvic anatomical problems, such as endometriosis (Abd El-Mawgod et al., 2016; Iacovides et al., 2015).

According to the World Health Organization (WHO), the prevalence of dysmenorrhea ranges from 1.7% to 97% (Vahdatpoor et al., 2020). Based on research results, the prevalence of women experiencing dysmenorrhea varies in each country, related to the methods and assessment techniques used during the study, ranging from 45% to 95%. Primary dysmenorrhea rates among female university students demonstrate wide international variability: Iran reports 89.10%, India 87% (Verma, 2014), Saudi Arabia 85.7%, Ethiopia 85.4%, Mexico 64.0%, and China 41.7% (Hu et al., 2020). Furthermore, Indonesia exhibits a notably high incidence of dysmenorrhea; figures cited by the *Occupational Environmental Journal* show a prevalence of 54.98% for primary and 9.36% for secondary dysmenorrhea (Gumangsari, 2014).

This condition significantly weakens women's capacity to participate in various spheres, such as professional, educational, and social activities. As a result, primary dysmenorrhea is identified as the principal driver of absenteeism from school and work, leading to detrimental effects on both workplace efficiency and educational outcomes (Hu et al., 2020), quality of life, and social activities among women (Pakpour et al., 2020). Dysmenorrhea imposes adverse consequences on the day-to-day lives of pubescent women. These effects include lowered educational achievement and impaired sleep patterns, along with negative psychological outcomes that contribute to heightened anxiety and depression (Pakpour et al., 2020). This condition poses a huge health problem and an academic challenge because the high prevalence among a large population affects medical costs and a decrease in productivity (Hu et al., 2020).

There are several non-pharmacological treatments to reduce pain in primary dysmenorrhea, including acupressure and pelvic rocking exercises. Several studies on acupressure can reduce dysmenorrhea pain, one of which is according to Rahmawati (2019) who stated that Acupressure applied specifically to the SP6 point demonstrates effectiveness in alleviating the discomfort associated with dysmenorrhea (Rahmawati et al., 2019), and can provide comfort and increase daily activities (Yati et al., 2019). Another similar study showed an effect of comfort and reduced menstrual pain after applying pressure to acupoints through the Tuina acupressure technique (Fitria & Haqqattiba'ah, 2020).

Similarly, pelvic rocking exercises have been shown to reduce dysmenorrhea pain intensity. Research by Mohamed and Hafez (2017) reported that pelvic rocking exercises can decrease pain intensity scores, pain severity and duration, menstrual flow duration, and the use of analgesic tablets during the first and second menstrual cycles after the intervention (Ghada E. El-Refaye et al., 2014).

The selection of acupressure and pelvic rocking exercises as non-pharmacological therapies is based on their advantages, including being easy to learn, safe, practical, low-cost, and feasible to perform independently and continuously (Rahmawati et al., 2019; Ghada E. El-Refaye et al., 2014). However, studies comparing these two techniques in pain management are still limited. Therefore, this study aims to determine the difference in effectiveness between acupressure and pelvic rocking exercises in reducing pain intensity in primary dysmenorrhea.

Although previous studies have demonstrated that both acupressure and pelvic rocking exercise are effective in reducing dysmenorrhea pain, most research has evaluated each intervention separately without direct comparison. In addition, several studies have limitations such as non-comparative designs, small sample sizes, and insufficient reporting of methodological aspects, including intervention standardization and control of confounding variables. To date, empirical evidence directly comparing the effectiveness of acupressure and pelvic rocking exercise among adolescent girls in Indonesia remains limited. Therefore, this study addresses this research gap by comparing two practical, low-cost, and easily applicable non-pharmacological interventions for managing dysmenorrhea pain in adolescents.

METHOD

This study employed a randomized two-group pretest–posttest experimental design. The study population consisted of female students experiencing primary dysmenorrhea at SMPN 128 Jakarta.

Participants were recruited using a simple random sampling technique from students who met the inclusion and exclusion criteria, ensuring that all eligible participants had an equal chance of being selected. A total of 64 respondents were included in the study.

After recruitment, participants were randomly allocated into two intervention groups using a simple lottery randomization method. Each participant drew a coded paper from a closed container indicating assignment to either the acupressure group or the pelvic rocking exercise group. Thirty-two respondents were assigned to the acupressure group and thirty-two respondents to the pelvic rocking exercise group.

Allocation concealment was maintained by using identical folded papers prepared by an independent assistant not involved in outcome assessment or intervention delivery. The group assignments were not disclosed prior to participant selection.

The inclusion criteria were female students who were willing to participate, experienced dysmenorrhea on the first day of menstruation within the past three months, had a regular menstrual cycle (21–35 days) with a duration of 3–7 days, and had not consumed analgesic medication within 24 hours prior to the intervention. The exclusion criteria included respondents diagnosed with gynecological disorders or secondary dysmenorrhea, as well as those under the influence of pain medication during the study.

The acupressure intervention was performed by applying moderate pressure to the SP6 (Sanyinjiao) point for approximately 10 minutes on the first day of menstruation. The pelvic rocking exercise group performed pelvic movements consisting of anterior–posterior and lateral motions for approximately 15 minutes in a single session on the first day of menstruation. All interventions were conducted according to standard operating procedures and were directly supervised by the researcher to ensure consistency.

Pain intensity was measured using the Numeric Rating Scale (NRS) before and after the intervention. Data normality was assessed using the Shapiro–Wilk test and showed a normal distribution ($p > 0.05$), indicating that parametric tests could be applied. Data analysis was conducted using paired sample t-tests to assess within-group differences and independent sample t-tests to compare the effectiveness between the two interventions, with a significance level set at $p < 0.05$.

This study did not specifically control for potential confounding variables such as physical activity level, body mass index (BMI), stress level, and prior history of dysmenorrhea, which may influence pain perception. Ethical approval was obtained from the Health Research Ethics Committee of Poltekkes Kemenkes Jakarta III (No. 147/SK.KEPK.UNR/VI/2021). Written informed consent was obtained from all participants and/or their guardians prior to data collection.

RESULTS

1. Effectiveness of Acupressure Technique on the Reduction of Dysmenorrhea Pain Intensity in Students of SMPN 128 Jakarta

Table 1. Mean Dysmenorrhea Pain Intensity Scores for SMPN 128 Jakarta Students Before and After Acupressure

Pain Intensity	N	Mean	Standar Deviasi (SD)
Pre Accupresure	32	7,03	1,656
Post Accupresure	32	5,47	1,722

The data presented in Table 1 reveal that acupressure successfully reduced the mean pain intensity from 7.03 (pre-intervention) to 5.47 (post-intervention), thereby showing a decrease in dysmenorrhea pain severity.

Table 2. Effectiveness of Dysmenorrhea Pain Intensity Reduction Pre Acupressure and Post Acupressure in Students of SMPN 128 Jakarta

Pain Intensity Reduction Mean	SD (Standar Deviation)	Standar Error Mean	95% CI	ρ value	t
1,562	0,619	0,109	1,339-1,786	0,000	14,281

With an average pain intensity drop of 1.562, the paired sample t-test on Table 2 indicated a statistically significant difference between pre- and post-intervention scores $\rho=0.000$ ($p<0.05$), $t=14.281\}\$$). Consequently, the findings support the conclusion that acupressure is a significantly effective technique for managing dysmenorrhea pain.

2. Effectiveness of *Pelvic Rocking Exercise* on the Reduction of Dysmenorrhea Pain Intensity in Students of SMPN 128 Jakarta

Table 3. Distribution of the Mean Dysmenorrhea Pain Intensity in Students of SMPN 128 Jakarta Pre and Post Pelvic Rocking Exercise

Pain Intensity	N	Mean	Standar Deviation (SD)
Pre Pelvic Rocking Exercise	32	7,78	1,431
Post Pelvic Rocking Exercise	32	5,75	1,849

Table 3 reveals a reduction in the mean pain intensity scores, dropping from 7.78 (pre-intervention) to 5.75 (post-intervention), thus demonstrating a difference in dysmenorrhea pain intensity. This finding indicates that dysmenorrhea pain intensity decreased following the pelvic rocking exercise intervention.

Table 4. Effectiveness of Dysmenorrhea Pain Intensity Reduction Pre and Post Pelvic Rocking Exercise in Students of SMPN 128 Jakarta

Pain Intensity Reduction Mean	SD (Standar Deviation)	Standar Error Mean	95% CI	ρ value	t
2,031	1,177	0,208	1,607-2,456	0,000	9,760

The paired sample t-test showed a mean reduction of 2.031 in pain intensity ($p < 0.001$; $t = 9.760$), indicating a significant difference between pre- and post-intervention measurements. Pelvic rocking exercise was therefore effective in reducing dysmenorrhea pain intensity.

3. Difference in Effectiveness Between Acupressure and *Pelvic Rocking Exercise* Techniques on the Reduction of Dysmenorrhea Pain Intensity in Students of SMPN 128 Jakarta

Table 5. Difference in Effectiveness Between Acupressure and Pelvic Rocking Exercise Techniques on the Reduction of Dysmenorrhea Pain Intensity in Students of SMPN 128 Jakarta

Intervention	N	Mean	SD (Standar Deviation)	ρ value
Accupresure	32	5,47	1,722	
Pelvic Rocking Exercise	32	5,75	1,849	0,531

Based on Table 5, the mean effectiveness in reducing dysmenorrhea pain intensity was 5.47 for the acupressure technique and 5.75 for the pelvic rocking exercise. The independent sample t-test analysis showed a p-value of 0.531 ($p > 0.05$), indicating no statistically significant difference between acupressure and pelvic rocking exercise in reducing dysmenorrhea pain intensity among students of SMPN 128 Jakarta.

DISCUSSION

The results of this study indicate that both acupressure and pelvic rocking exercise were effective in reducing dysmenorrhea pain intensity among students of SMPN 128 Jakarta. In the acupressure group, the mean pain intensity decreased significantly after the intervention ($p < 0.001$). This reduction can be explained by the mechanism of acupressure point stimulation, particularly at the SP6 point, which is known to enhance endorphin release, improve blood circulation, and inhibit the transmission of pain impulses through the gate control theory mechanism. These findings are consistent

with previous studies by Hidayah et al. (2024) and Rahmawati et al. (2019), which reported that acupressure is an effective non-pharmacological therapy for reducing dysmenorrhea pain in adolescents.

In the pelvic rocking exercise group, a significant reduction in pain intensity was also observed ($p < 0.001$). This exercise works by increasing blood flow to the pelvic region, reducing uterine muscle spasms, and promoting muscle relaxation, all of which contribute to a decreased perception of pain. These findings are consistent with the study by El-Refaye et al. (2014), which reported that pelvic exercises significantly reduce both the intensity and duration of dysmenorrhea pain.

Although pelvic rocking exercise demonstrated a greater mean reduction in pain intensity compared to acupressure (2.03 vs. 1.56), the difference was not statistically significant ($p > 0.05$). This finding may be influenced by several factors, including the relatively small sample size, which may have limited the statistical power to detect differences between groups. In addition, pain perception is inherently subjective and influenced by individual variability, psychological factors, and differing pain thresholds, which may increase data variability (standard deviation) and affect statistical outcomes. From a physiological perspective, both interventions have relatively similar mechanisms, such as improving blood circulation and stimulating the release of endogenous analgesic mediators, which may explain their comparable effectiveness.

These findings are further supported by a systematic review by Armour et al. (2019), which reported that various non-pharmacological interventions, including acupressure techniques and physical exercises, demonstrate relatively comparable effectiveness in reducing primary dysmenorrhea pain. Globally, most studies indicate that non-pharmacological approaches rarely show markedly superior effectiveness over one another; instead, they emphasize safety, ease of use, and individual preference in their application (Armour et al., 2019).

Clinically, although no significant difference was observed between the two techniques, both remain practically meaningful as they effectively reduce pain intensity without pharmacological side effects. This is particularly important in adolescent populations, who require therapeutic approaches that are safe, easy to implement, and suitable for self-management.

Despite the promising findings, several limitations of this study should be acknowledged. First, the study did not control several potential confounding variables known to influence dysmenorrhea pain intensity, including stress level, physical activity, sleep quality, body mass index (BMI), caffeine consumption, and prior history or severity of dysmenorrhea. These factors may affect individual pain perception, hormonal responses, and physiological adaptation to pain, thereby potentially influencing the effectiveness of the interventions and contributing to variability in pain scores among participants.

Second, although random allocation was applied, the relatively small sample size may have limited the statistical power to detect subtle differences between the two intervention groups. Third, the study was conducted in a single educational institution, which may reduce the generalizability of the findings to broader adolescent populations with different demographic and socio-cultural characteristics. In addition, pain intensity was measured using self-reported responses through the Numeric Rating Scale (NRS), which is inherently subjective and may be influenced by emotional and psychological conditions at the time of assessment.

Therefore, future studies are recommended to include larger and more diverse samples, control important confounding variables, and apply more rigorous randomized controlled trial designs to strengthen internal validity and improve the reliability of the findings.

CONCLUSION

Acupressure and pelvic rocking exercise were proven to be effective in reducing dysmenorrhea pain intensity ($p < 0.001$). However, no significant difference was found between the two interventions in terms of effectiveness ($p > 0.05$), indicating that both can be recommended as safe and practical non-pharmacological alternatives for adolescent girls.

Future studies are recommended to involve larger sample sizes and to evaluate the potential combined effects of both interventions in achieving more optimal pain reduction.

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