

Prevalence, Severity, and Self-Medication for Dysmenorrhea among Female Adolescents in Indonesia

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Abstract

Dysmenorrhea, commonly referred to as menstrual pain, is a prevalent condition affecting many reproductive-aged women, particularly female adolescents, with varying degrees of intensity. Dysmenorrhea affects 64.5% of female adolescents in Indonesia, with the highest prevalence rates found in West Java (98.8%) and Jakarta (87.5%). Over the years, various therapy modalities have been developed for treating this condition based on its pathophysiology. However, in Indonesia, a country renowned for its rich natural resources and medicinal herbs, there is a prevailing belief in the efficacy of traditional medicine. Female adolescents in Indonesia are often engaged in self-medication practices, combining traditional medicine with nonsteroidal anti-inflammatory drugs (NSAIDs). This study aimed to analyze the prevalence, severity, and self-medication practices for dysmenorrhea among female adolescents in Indonesia. The study was conducted from January to December 2020 using an online survey that included questions about menstrual pain, family history, and the use of traditional medicine and NSAIDs. This study comprised 362 participants recruited through convenience sampling. Results showed that 92.5% of participants experienced dysmenorrhea with varying degrees of pain. A total of 216 (59.9%) female adolescents experienced frequent dysmenorrhea, while 118 (32.6%) reported experiencing this condition every menstrual cycle. Of all participants, 33.1% used traditional medicine as a treatment option, and 16.9% used NSAIDs. According to the self-reported visual analog scale (VAS), the use of natural remedies, such as traditional medicine, was associated with lower pain levels, suggesting their potential benefits in healthcare services for dysmenorrhea.

Keywords: Dysmenorrhea, Indonesia, self-medication, traditional medicine

Introduction

Dysmenorrhea, also known as menstrual pain, is a common gynecological condition that affects approximately 70% of female adolescents worldwide.^{1–3} In Indonesia, the prevalence is also high, with 64.5% of female adolescents experiencing dysmenorrhea, particularly in urban areas such as Jakarta (87.5%) and West

Java (98.8%).^{4–8} This finding did not differ from the prevalence of dysmenorrhea among other countries, ranging from 20–93%.⁷ The high prevalence can be attributed to its perception as a normal condition, leading to a delay between the onset of symptoms and proper diagnosis.^{9,10} This delay has various adverse effects, including reduced reproductive potential and daily functional life. Therefore, early identification and treatment have the potential to reduce pain, prevent disease progression, reduce organ damage, and preserve fertility.^{11,12} The severity of dysmenorrhea can significantly impact daily activities. Many adolescents are unable to attend school or participate in regular routines due to

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menstrual pain. Studies have shown that 13–51% of adolescents report school absenteeism at least once, with 5–14% experiencing repeated absences.¹³ A study conducted in India discovered that the prevalence of dysmenorrhea was high among adolescents (84.2%), with 34.2% experiencing severe pain with VAS 7–10, 36.6% experiencing moderate pain with VAS 4–7, and 29.2% experiencing mild pain with VAS 2–4.¹⁴ Another study conducted in Jakarta, Indonesia found that the majority of adolescents have moderate pain (65.42%), followed by mild and severe pain (22.92% and 1.67%, respectively).⁷ Several studies have also shown that dysmenorrhea imposes a significant health and social burden, particularly during productive periods. The impact of dysmenorrhea on the quality of life is profound, manifesting in compromised physical functioning, diminished general health perception, and reduced vitality.¹⁵

Various treatment modalities are available to manage dysmenorrhea.¹¹ Nonsteroidal anti-inflammatory drugs (NSAIDs) and oral contraceptives are often recommended as the first-line drugs for treatment. However, their effectiveness can be increased by complementary therapies, such as local heat or regular exercise. Previous reports have also suggested that traditional therapies, such as the consumption of turmeric and ginger can reduce menstrual pain and be developed as alternatives.^{6,7} Several traditional herbs, including cinnamon, mint, fennel, coriander, and chamomile, have also been reported to alleviate dysmenorrhea symptoms.^{16–18} The treatment of dysmenorrhea in Indonesia has been reported to significantly differ from other countries, particularly regarding the use of alternative and traditional medicine over pain relief drugs.^{6,18} The use of traditional medicine is further supported by various in-vitro and in-vivo studies explaining their proposed mechanism of action.¹⁹

Despite the widespread use of self-medication—particularly the combination of NSAIDs and traditional herbal treatments—among Indonesian adolescents, data on the prevalence and patterns of such practices remain limited. Therefore, this study aims to analyze the prevalence, severity, and self-medication practices related to dysmenorrhea among female adolescents in Indonesia.

Methods

This study used a survey-based cross-sectional

design. The sample size was determined using a sample size calculation with a minimal sample size of 96 participants, and participant recruitment was conducted using convenience sampling.

Sample size calculation:

$$\frac{Z\alpha^2 PQ}{d^2}$$

Where:

$Z\alpha$ = standard normal deviate for a 5% significance level (1.96)

P = proportion of the category studied, then it becomes 50%

Q = 1 - P, then it becomes 0.50

d = precision, 10%

Meaning:

$$\frac{[(1.96)^2 \times 0.50 \times 0.50]}{(0.10)^2} = 96.04 = 96$$

Participant recruitment was conducted using convenience sampling. The survey was conducted between January 2020 and December 2020, targeting female high school students in Jakarta. The inclusion criteria were: (1) female adolescents aged 14 to 18 years, and (2) those who had already experienced menstruation. Jakarta was selected as the study site due to its diversity in ethnicity and socioeconomic status, which offers a representative sample of Indonesian adolescents. An online questionnaire was created using the Google form platform (collected during the COVID-19 pandemic) to collect information on name, age (including birth date and year), dysmenorrhea characteristics, menstrual characteristics, its impact on daily life, specifically the absent days due to dysmenorrhea, additional symptoms, as well as the usage of NSAIDs and traditional medicines. The level of dysmenorrhea was assessed using a self-reported visual analog scale (VAS).

The collected data were analyzed using SPSS Statistics version 25. Descriptive statistics were applied to variables including age, body mass index (BMI), and first-degree family history of dysmenorrhea. Subsequently, the results were presented using either mean and standard deviation for normally distributed variables or median and range for abnormally distributed variables. The Chi-square test was implemented to evaluate the influence of dysmenorrhea on absenteeism and the utilization of NSAIDs. ROC curve analysis was also presented using independent variables of NSAIDs and traditional

Table 1 Clinical and Sociodemographic Characteristics of Subjects

Variables	Frequency (n=362)
Age (years)*	17 (14–18)
Body mass index (kg/m ²)	20.82 (14.28–37.8)
Underweight	70 (19.3%)
Normal weight	202 (55.8%)
Overweight/Obese	90 (24.9%)
First-degree family history of dysmenorrhea	
Yes	151 (41.7%)
No	211 (58.3%)
Relationship with family history	
Mother	83 (22.9%)
Sister	52 (14.4%)
Both	16 (4.4%)

* median (min–max)

medicine use and the dependent variable of intensity of pain by VAS. The Youden index was then used to determine the optimal cut-off point for the VAS in evaluating treatment effectiveness for dysmenorrhea.

This study was approved by the Health Research Ethics Committee, with ethical clearance letter number ND-1571/UN2.F1/ETIK/PPM.00.02/2020, and was conducted in accordance with the ethical standards outlined in the Declaration of Helsinki. Informed consent was obtained from all participants prior to their inclusion in the study.

Results

A total of 362 participants met the inclusion

criteria and were included in the final analysis. The clinical and sociodemographic variables of these subjects are presented in Table 1. The nutritional status of female adolescents was evaluated using body mass index, which yielded a mean of 20.82. A total of 70 patients were classified as underweight (19.3%), 202 subjects were of normal weight (55.8%), and 90 participants were categorized as overweight or obese (24.9%). A first-degree family history of dysmenorrhea was reported by 151 participants (41.7%), which included 83 cases (22.9%) from their mother, 52 (14.4%) from a sister, and 16 (4.4%) from both mother and sister.

The menstrual characteristics of the participants are shown in Table 2. The median age of the first menarche was 12 years, with

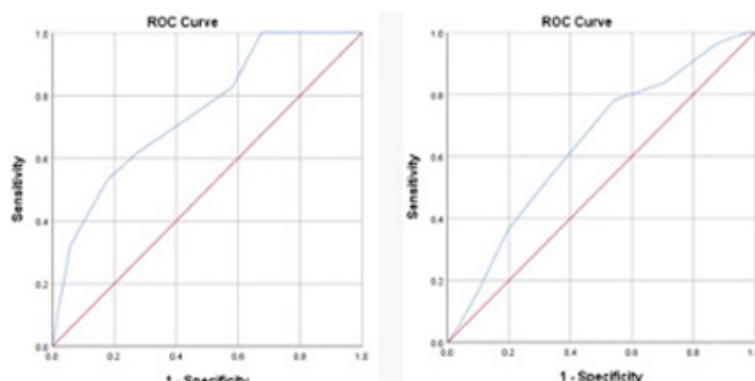


Figure 1 ROC Curve of NSAID Use on Menstrual Pain (Fig. 1a) and ROC Curve of Traditional Medicine Use (Fig. 1b)

Table 2 Menstrual Characteristics of Subjects

Variables	Frequency (n=362)
First menstrual age (years)*	12 (9–16)
Menstrual cycle length	
<24 days	80 (22.1%)
24–32 days	244 (67.4%)
>32 days	38 (10.5%)
Menstrual cycle variation	
≤2 days	89 (24.6%)
3–5 days	187 (51.7%)
>5 days	86 (23.8%)
Menstrual duration	
<3 days	34 (9.4%)
3–5 days	181 (50%)
>5 days	147 (40.6%)
Vaginal discharge	
Yes	314 (86.7%)
No	48 (13.3%)
Regular vaginal discharge	
Yes	138 (43.5%)
No	179 (56.5%)
Menstrual pain	
Yes	335 (92.5%)
No	27 (7.5%)
Menstrual pain VAS*	5 (1–10)
Dysuria	
Yes	33 (9.1%)
No	329 (90.9%)
Dyschezia	
Yes	69 (19.1%)
No	293 (80.9%)

* Median (min–max)

the youngest and oldest being 9 and 16 years, respectively. The results showed that 335 participants (92.5%) had experienced dysmenorrhea with a VAS median of 5, ranging from 1 to 10 among all subjects. However, the majority did not experience dysuria (90.9%) and dyschezia (80.9%).

The impacts of dysmenorrhea on daily life were also recorded, including the usage of NSAIDs and traditional medicine. The results showed that 61 female adolescents (16.9%) had

used NSAIDs for dysmenorrhea management. A total of 120 subjects (33.1%) reported the use of traditional medicine, with 116 using turmeric (32.1%), while others used galangal and betel leaf (0.5%). Based on these results, the majority of the subjects used traditional medicine (33.1%) compared to NSAIDs (16.9%) to relieve dysmenorrhea. The impact of dysmenorrhea on daily life was recorded through absence from school due to the condition. A total of 22 participants (6.1%) had recorded absenteeism

Table 3 Impact of Menstrual Pain on Subjects

Variables	Frequency (n=362)
NSAID use*	
Yes	61 (16.9%)
No	301 (83.1%)
Frequency of NSAID use	
Everyday	1 (0.3%)
Once per week	7 (1.9%)
Once per month	11 (3%)
During menstruation	42 (11.6%)
Never	301 (83.1%)
Use of traditional medicine	
Yes	120 (33.1%)
No	242 (66.9%)
Type of traditional medicine	
Turmeric	106 (29.3%)
Galangal	2 (0.6%)
Betel leaf	2 (0.6%)
None	252 (69.6%)
Absent due to menstrual pain*	
Yes	22 (6.1%)
No	340 (93.9%)
Number of absent days	
1	16 (72.8%)
2	3 (13.6%)
3	3 (13.6%)

*Significant variables related to VAS score ($p < 0.05$) based on Chi-square test

from school, with 16 reporting only one absent day ($n=16$; 72.8%). The results showed that there was a significant correlation between the use of NSAIDs and absence from school with VAS. The impact of menstrual pain is presented in Table 3.

The receiver operating characteristic (ROC) curve in Figure 1 showed the use of NSAIDs (Figure 1a) and traditional medicine (Figure 1b). The area under the curve (AUC) of each curve was 0.748 and 0.640 for the use of NSAIDs and traditional medicine, respectively. Based on the Youden index, a level of 4.5 was determined to be the specific VAS level needed to use traditional medicine with sensitivity and specificity values of 78.2% and 45.7%, respectively. Meanwhile, a level of 6.5 was determined to be recommended

for NSAIDs use with sensitivity and specificity values of 61.8% and 72.5%, respectively.

Discussion

This study includes 362 participants, the majority of whom have a normal body mass index (55.8%). The majority of study participants do not possess an increased risk of having dysmenorrhea, as prior research has demonstrated that obese and underweight females are more prone to this condition.²⁰ A total of 58.3% of participants do not have first-degree family with menstrual pain. Several conditions increase the risk of developing dysmenorrhea, one of them including positive dysmenorrhea experienced by first-degree family such as mother or sister. The risk of developing dysmenorrhea nearly doubled with a positive family history.²¹ This indicates that the majority of our participants are not susceptible to experiencing dysmenorrhea.

Dysmenorrhea poses a significant burden on adolescents' daily lives, affecting physical, emotional, and social well-being.²² In this study, 92.5% of participants report experiencing menstrual pain, with a range of pain severity. Several subjects had additional symptoms of painful urination (9.1%) and defecation (19.1%). These results were consistent with previous studies, which also obtained similar results. A high prevalence rate of dysmenorrhea was reported in West Java by Februanti et al., where a rate of 98.8% was recorded.⁸ Another study in France and Stockholm also reported a relatively high prevalence of 92.9% and 89%.^{23,24} These results showed that dysmenorrhea was one of the common health problems among female adolescents in the world. However, the variation in the prevalence could be due to the use of different diagnostic tools or perceptions of menstruation.

Based on the results, a total of 33.1% of the subjects consumed traditional medicine, with 32.1% using turmeric. This percentage was higher compared to those who used NSAIDs (over-the-counter painkillers/OTC), with 11.6% taking these painkillers only during menstruation. This aligns with the findings of Silaen et al., who report that 75% of female adolescents in Indonesia prefer traditional methods for managing menstrual pain. Both traditional and modern treatments appear effective in alleviating dysmenorrhea symptoms.⁶ Dysmenorrhea in this study was reported as a VAS score, and the variable was considered to

have a significant association with the use of NSAIDs. A ROC curve was presented for NSAIDs and traditional medicine usage, and the Youden index was then used. Consequently, it was implied that traditional medicine was commonly used for a VAS of 4.5, while NSAIDs were used for a VAS of 6.5.

A common problem associated with the incidence of dysmenorrhea was decreased concentration and motivation to learn. This often led to an inability to participate in learning activities optimally and absenteeism from school. In this study, 6.1% of the subjects were absent from school due to the condition, with the majority (72.8%) being absent for one day. A similar result was obtained by Silaen et al., where 12.5% of female adolescents were absent from school activities due to dysmenorrhoea.⁶

Consensus guidelines recommend NSAIDs as the first-line treatment for primary dysmenorrhea.²⁵ The Society of Obstetricians and Gynaecologists of Canada Clinical Practice-Gynaecology and CANPAGO Committees had also published guidelines that recommended NSAIDs use as first-line treatment for spasmodic dysmenorrhoea. This result was also supported by Rafique et al., where 55.8% of the subjects used the drugs to relieve their pain.²⁶ However, research by Utami et al.²⁷ showed that some Indonesians were unaware of the effectiveness of NSAIDs.

The limitations of this study are the possibility of bias due to the use of non-probability sampling and the self-reporting nature, which had the potential to cause recall bias and lead to inaccuracies. In addition, the procedures were carried out in several high schools in Jakarta, which might not represent other regions in Indonesia. Further studies using a more generalized population are needed to obtain objective data on the treatment options for dysmenorrhea.

In conclusion, this study identifies a dysmenorrhea prevalence of 92.5% among female adolescents. More participants report using traditional medicine than NSAIDs for pain relief. Based on self-reported VAS scores, traditional medicine is associated with lower pain levels, suggesting it may serve as a beneficial complementary approach in adolescent menstrual health management.

References

1. Dowlut-Mcelroy T, Strickland JL.

- Endometriosis in adolescents. *Curr Opin Obstet Gynecol*. 2017;29(5):306–9.
2. Bafort C, Beebejaun Y, Tomassetti C, Bosteels J, Duffy JM. Laparoscopic surgery for endometriosis. *Cochrane database Syst Rev*. 2020;10:CD011031.
3. Saridoğan E. Endometriosis in teenagers. *Women's Heal*. 2015;11(5):705–9.
4. Sachedina A, Todd N. Dysmenorrhea, endometriosis and chronic pelvic pain in adolescents. *J Clin Res Pediatr Endocrinol*. 2020;12(Suppl 1):7–17. doi: 10.4274/jcrpe.galenos.2019.2019.S0217.
5. Parasar P, Ozcan P, Terry KL. Endometriosis: epidemiology, diagnosis and clinical management. *Curr Obstet Gynecol Rep*. 2017;6(1):34–41. doi: 10.1007/s13669-017-0187-1.
6. Silaen RMA, Ani LS, Putri WCWS. Prevalensi Dysmenorrhea dan karakteristiknya pada remaja putri di Denpasar. *J Med Udayana*. 2019;8(11):1–6.
7. Juniar D. Epidemiology of Dysmenorrhea among female adolescents in Central Jakarta. *Makara J Heal Res*. 2015;19(1):21–26.
8. Februanti S, Kartilah T, Hartono D, Aryanti D. Adolescent dismenore prevalence in West Java, Indonesia: preliminary study. *J Critical Reviews*. 2020;7(14):681–4.
9. Giudice LC. Endometriosis. Risk, Reliab Saf Innov Theory Pract - Proc 26th Eur Saf Reliab Conf ESREL 2016. 2017;362(25):175.
10. Mukti P. Faktor risiko kejadian endometriosis. *unnes J Public Heal*. 2014;3(3):1–10
11. Chen LH, Lo WC, Huang HY, Wu HM. A lifelong impact on endometriosis: pathophysiology and pharmacological treatment. *Int J Mol Sci*. 2023;24(8):7503. doi: 10.3390/ijms24087503.
12. Dun EC, Kho KA, Morozov VV, Kearney S, Zurawin JL, Nezhat CH. Endometriosis in adolescents. *JSLs*. 2015;19(2):e2015.00019. doi: 10.4293/JSLs.2015.00019.
13. Halitopo Y. The Relationship of the Dysmenorrhea a in Students with Learning Activities. *Midwifery*. 2022;10(5):4149-54.
14. Kural M, Noor N, Pandit D, Joshi T, Patil A. Menstrual characteristics and prevalence of dysmenorrhea in college going girls. *J Family Med Prim Care*. 2015;4(3):426.
15. Esan DT, Ariyo SA, Akinlolu EF, Akingbade O, Olabisi OI, Olawade DB, et al. Prevalence of dysmenorrhea and its effect on the quality of life of female undergraduate students in Nigeria. *J Endometriosis Uterine Disorders*. 2024;5:100059. doi: 10.1016/j.

- jeud.2024.100059.
16. Kashani L, Mohammadi MR, Heidari M, Akhondzadeh S. Herbal medicine in the treatment of primary dysmenorrhea. *Journal of Medicinal Plants*. 2015; 15:1–5.
17. Xu Y, Yang Q, Wang X. Efficacy of herbal medicine (cinnamon/fennel/ginger) for primary dysmenorrhea: a systematic review and meta-analysis of randomized controlled trials. *J Int Med Res*. 2020;48(6):300060520936179. doi: 10.1177/0300060520936179.
18. Mirabi P, Alamolhoda SH, Esmaeilzadeh S, Mojab F. Effect of medicinal herbs on primary dysmenorrhoea- a systematic review. *Iran J Pharm Res*. 2014;13(3):757–67.
19. Park KS, Park KI, Hwang DS, Lee JM, Jang JB, Lee CH. A review of in-vitro and in-vivo studies on the efficacy of herbal medicine for primary dysmenorrhea. *Evid Based Complement Alternat Med*. 2014;2014:296860. doi:10.1155/2014/296860
20. Ju H, Jones M, Mishra GD. A U-Shaped relationship between body mass index and dysmenorrhea: a longitudinal study. *PLoS One*. 2015;10(7):e0134187. doi: 10.1371/journal.pone.0134187.
21. Nyirenda T, Nyagumbo E, Murewanhema G, Mukonowenzou N, Kagodora SB, Mapfumo C, et al. Prevalence of dysmenorrhea and associated risk factors among university students in Zimbabwe. *Womens Health (Lond)*. 2023 Jan-Dec;19:17455057231189549. doi: 10.1177/17455057231189549.
22. Ghandour R, Hammoudeh W, Stigum H, Giacaman R, Fjeld H, Holmboe-Ottesen G. The hidden burden of dysmenorrhea among adolescent girls in Palestine refugee camps: a focus on well-being and academic performance. *BMC Public Health*. 2024;24(1):1–12 doi: 10.1186/s12889-024-18219-0.
23. Hadjou OK, Jouannin A, Lavoue V, Levêque J, Esvan M, Bidet M. Prevalence of dysmenorrhea in adolescents in France: Results of a large cross-sectional study. *J Gynecol Obstet Hum Reprod*. 2022;51(3):102302. doi: 10.1016/j.jogoh.2021.102302.
24. Söderman L, Edlund M, Marions L. Prevalence and impact of dysmenorrhea in Swedish adolescents. *Acta Obstet Gynecol Scand*. 2018;98(2):215–21. doi: 10.1111/aogs.13480.
25. Burnett M, Lemyre M. No. 345-Primary Dysmenorrhea Consensus Guideline. *J Obstet Gynaecol Can*. 2017;39(7):585–95. doi: 10.1016/j.jogc.2016.12.023.
26. Rafique N, Al-Sheikh MH. Prevalence of primary dysmenorrhea and its relationship with body mass index. *J Obstet Gynaecol Res*. 2018;44(9):1773–8. doi:10.1111/jog.13697
27. Utami PR, Octavia DR, Fandinata SS. The level of knowledge on the use of NSAIDs as analgesic for dysmenorrhea case in faculty of health Universitas Muhammadiyah Lamongan. *Jurnal Midpro*. 2020;12(2):287–94. doi: 10.30736/md.v12i2.245