Menstrual Cycle Patterns and the Role of Coping Mechanisms in Medical Students with Dysmenorrhea: An Observasional Study

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Abstract

Introduction: *More than 50% of women worldwide experience dysmenorrhea, and its often worsening with irregular menstrual cycles. Women adopt both adaptive and maladaptive coping mechanisms to manage pain. This study examines the relationship between menstrual cycle irregularities, dysmenorrhea severity, and coping mechanisms.*

Method: *This a cross-sectional study involving medical students in Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta (UMY), from September to November 2022. The inclusion criteria aged 18 to 23 years, physically healthy with no history of reproductive health issues, possessing a normal body mass index (BMI), and being non-smokers. Data on menstrual cycles pattern (normal, poly-, or oligomenorrhea), dysmenorrhea severity, and coping mechanisms were collected through online validated-questionnaires and analyzed using the Chi-Square test.*

Results: *Among 174 subjects, the majority experienced moderate dysmenorrhea (67.8%) and had a normal menstrual cycle (81.6%). A total of 93.6% employed adaptive coping mechanisms. This study found a significant association between the menstrual cycle and the severity of dysmenorrhea (p=0.031), as well as the effectiveness of adaptive coping in reducing dysmenorrhea severity (p=0.0001).*

Conclusion: *The length of the menstrual cycle is associated with dysmenorrhea severity, while adaptive coping mechanism may alleviates its intensity.*

Keywords: *Dysmenorrhea, Menstrual cycle, Coping mechanisms*

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Pola Siklus Haid dan Peran Mekanisme Koping pada Mahasiswa Kedokteran dengan Dismenore: Sebuah Studi Observasional

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Abstrak

Pendahuluan: *Lebih dari 50% perempuan di seluruh dunia pernah mengalami dismenore, dan derajat keparahannya dapat menjadi lebih berat apabila siklus haid tidak teratur. Ketika mengalami dismenore seorang perempuan dapat menggunakan mekanisme koping yang adaptif maupun maladaptif. Studi ini menilai hubungan antara pola siklus haid, derajat keparahan dismenore, dan mekanisme koping.*
Metode: *Studi potong-lintang ini melibatkan mahasiswa kedokteran di Fakultas Kedokteran dan Ilmu Kesehatan Universitas Muhammadiyah Yogyakarta (UMY) sejak September hingga November 2022. Kriteria inklusi meliputi usia 18-23 tahun, sehat secara fisik tanpa adanya riwayat kelainan reproduksi, memiliki indeks massa tubuh normal, dan tidak merokok. Data mengenai pola siklus haid (normal, poli-, atau oligomenore), derajat keparahan dismenore, dan mekanisme koping diperoleh melalui kuesioner daring yang telah divalidasi sebelumnya. Data dianalisis menggunakan uji Chi-Square.*
Hasil: *Dari 174 subyek penelitian, mayoritas mengalami dismenore derajat sedang (67,8%) dan siklus haid normal (81,6%). Sebanyak 93,6% subyek memiliki mekanisme koping yang adaptif. Studi ini menemukan adanya asosiasi antara pola siklus haid dengan derajat keparahan dismenorea (p=0,031), serta mekanisme koping adaptif berhubungan dengan derajat keparahan dismenorea yang lebih rendah (p=0,0001).*
Kesimpulan: *Pola siklus haid berhubungan dengan derajat keparahan dismenore, dan mekanisme koping yang adaptif dapat mengurangi intensitas dismenore.*

Kata kunci: *Dismenore, Siklus haid, Mekanisme koping.*

Introduction

Medical students are generally assumed to have sufficient knowledge regarding dysmenorrhea and its management; however, its prevalence remains high. A multi-institutional study reported that the prevalence of dysmenorrhea ranges from 60% to 95%, with the majority of cases classified as mild.[1-3] Moreover, prolonged menstrual periods, stress, and depression have been directly linked associated with the occurrence of dysmenorrhea.[2]

Although not life-threatening, dysmenorrhea can cause considerable discomfort. Individual experiencing dysmenorrhea may present with sympyoms such as fatique, lethargy, and pain, which can substantially impair concentration and daily functioning. Moreover, dysmenorrhea has a negative impact on academic performance and the overall quality of life of female students.[3,4] A considerable proportion of women suffering from dysmenorrhea miss one or two days of work or school due to its symptoms.[4,5] Adolescent females with dysmenorrhea may also experience emotional conflict, tension, and anxiety, which can impair concentration in academic settings and reduce their overall performance.[6,7] Additionally, dysmenorrhea has a detrimental impact on woman's quality of life, often resulting in psychological distress. Furthermore, studies have identified a correlation between emotional regulation and the intensity of menstrual pain, suggesting that psychological factors may influence dysmenorrhea severity.[8]

Factors such as genetics, age at menarche, family history, menstrual cycle length, and the volume and duration of menstruation are known to influence the occurrence and

severity of dysmenorrhea. Among menstrual cycle parameters, menstrual duration and volume, as well as the adolescents' social lives, exhibit the strongest association with dysmenorrhea.[9] Additionally, blood clot formation, duration of bleeding, and familial predisposition have been identified as contributing factors to the risk of developing dysmenorrhea.[10]

The severity of dysmenorrhea pain is influenced by coping mechanisms. Various pharmacological and non-pharmacological interventions for dysmenorrhea have been extensively studied. Most women experiencing dysmenorrhea are already aware of available treatment options. Common management strategies include crying, obtaining adequate sleep, applying warm compresses or oil to the affected area, massage, rest, breathing exercise, and engaging in gymnastics or gentle physical activity. Additionally, nonsteroidal anti-inflammatory drugs (NSAIDs) or analgesic medications are used when pain significantly interferes with daily activities.[11,12]

Individuals may employ both adaptive and maladaptive coping strategies to manage discomfort. Maladaptive coping mechanisms exacerbate symptom, whereas adaptive coping strategies facilitate effective adjustment and pain management. Adaptations plays a crucial role as a coping mechanism, with emotional and behavioral regulation being particularly essential for adolescents. Inadequate self-regulation may contribute to behavioral problems and reduced coping efficacy.[13]

Nursing students commonly employ adaptive coping strategies, with the most prevalent being seeking support from friends (66.7%). In contrast, the most frequently reported maladaptive coping strategies during mentrual pain are sobbing (38.3%) and anger (40%).[14] Given prior limited observations indicating a high prevalance of dysmenorrhea among Universitas Muhammadiyah Yogyakarta (UMY) medical students from 2019 to 2021, further investigation into menstrual cycle patterns, coping strategies, and dysmenorrhea severity in this population is warranted. The findings of this study may aid adolescents in identifying and adopting effective coping strategies for managing dysmenorrhea.

Method

This study was designed as an observational cross-sectional research conducted at the Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta (UMY), from September to November 2022. The study was approved by the Health Research Ethics Committee (KEPK) of the UMY Faculty of Medicine and Health Sciences (Approval No. 105/EC-KEPK FKIK UMY/IV/2022).

The research subjects comprised voluntary individuals who experienced dysmenorrhea and meet the following criteria: aged 18 to 23 years, physically healthy with no history of reproductive health issues, possessing a normal body mass index (BMI), and being non-smokers. The research tools included calendars and questionnaires. Data collection was conducted by distributing questionnaires via Google Forms. Respondents provided information on the their menstrual cycle pattern, the severity of dysmenorrhea pain, and the coping mechanisms they employed. The severity of dysmenorrhea pain was measured using the Numeric Rating Scale (NRS), a widely used tool for measuring pain intensity. The NRS is considered easy to understand and sensitive to variations in dosage, gender and ethnic differences. In this study, participants rated their pain on a scale from 0 to 10, where 0 indicated no pain and 10 erpresented extreme pain.

The instrument utilized in this study was a questionnaire assessing coping mechanisms, which underwent rigorous testing to ensure both validity and reliability. Content validity was evaluated through a comprehensive literature review and expert consultations with faculty members at the Faculty of Nursing, University of North Sumatra (Haryani, 2012). The result indicated that all items were valid, as the calculated r value exceeded the r table value of 0.443. A reliability test was conducted with 20 respondents at Kartika I-II Medan Helvetia Junior High School, yielding a Cronbach's Alpha value of 0.79, thereby meeting the reliability criterion (>0.6). Additionally, the Numeric Rating Scales (NRS) pain scale demonstrates high validity (r=0.90) and reliability exceeding 0.95, as reported by Li, et al. (2007).

The collated data obtained were analyzed both univariate and bivariate methods. Univariate analysis included variables such as age, menstrual cycle pattern, dysmenorrhea occurence, dysmenorrhea severity, and coping mechanisms. Bivariate analysis examined the relationships between the menstrual cycle pattern and dysmenorrhea severity. Correlation analysis for nominal-ordinal data was conducted using the Chi-Square Test.

Results

A total of 174 subjects were included in this study. The majority of subjects were 20 and 21 years old, accounting for 33.3% and 29.7% of the sample, respectively. In contrast, only 2.1% and 3.1% subjects aged 18 and 23 years old, respectively. Menstrual cycle patterns among subjects were classified as normal, polymenorrhea, or oligomenorrhea. The majority of subjects had a regular menstrual pattern (n=156, 81.3%). The number of subjects experiencing polymenorrhea and oligomenorrhea was comparatively low, with 18 students (9.4%) in each category. The highest prevalence of dysmenorrhea was observed in primary dysmenorrhea, affecting 168 subjects (87.5%). The lowest recorded prevalence was for endometriosis, identified in only two subjects (1%). In total, 90.6% subjects reported experiencing dysmenorrhea. The most severe level of dysmenorrhea-related discomfort was classified as moderate (n=82, 42.7%). Among subjects experiencing dysmenorrhea, the majority (n=163, 93.6%) adopted adaptive coping strategies to manage their symptoms, whereas a minority relied on dysfunctional coping mechanisms.

Notably, respondents with oligomenorrhea exhibited significantly higher levels of severe dysmenorrhea compared to those with normal menstrual cycles and polymenorrhea (p=0.031).

Table 3 demonstrates that a greater number of respondents experienced a reduction in dysmenorrhea severity when utilizing adaptive coping mechanisms compared to those employing maladaptive coping mechanisms (p=0.0001).

Discussion

This study indicates that the prevalence of primary dysmenorrhea among medical students is 87.5%, with pain ranging from mild to severe. These findings are consistent with the reported prevalence of dysmenorrhea among adolescents aged 18-23 years, which reaches 85% with varying intensity. Dysmenorrhea in this age group is often influenced by academic stress levels, lifestyle changes, and hormonal adaptations that remain unstable since puberty. Notably, among medical students, the prevalence of dysmenorrhea may be even higher, estimated at 90%, due to increased academic pressure and irregular sleep

Table 1. Dysmenorrhea Pain Severity Before and After Adaptive and Maladaptive Coping

Degree of Dysmenorrhea Pain	Coping			
	Adaptive (n=163)		Maladaptive (n=11)	
	Pre-Coping (n,%)	Post-Coping (n,%)	Pre-Coping (n,%)	Post-Coping (n,%)
Mild	52 (31.9)	125 (76.7)	1 (9.1)	3 (27.3)
Moderate	78 (47.6)	32 (19.6)	4 (36.4)	4 (36.4)
Severe	33 (20.2)	6 (3.7)	6 (54.5)	4 (36.4)

Table 1 presents the impact of both maladaptive and adaptive coping strategies on the intensity of dysmenorrhea pain. Following the implementation of coping techniques, a reduction in the proportion of respondents experiencing severe and moderate dysmenorrhea was observed. Notably, adaptive coping strategies appeared to be more effective in alleviating pain compared to maladaptive strategies.

Table 2 indicates that the highest proportion of severe dysmenorrhea was observed among individuals with oligomenorrhea. The greatest overall prevalence of dysmenorrhea occurred in individuals with a normal menstrual cycle, while those with polymenorrhea predominantly experienced moderate pain.

and dietary patterns.[15] Stressors related to academic demands and clinical responsibilities can exacerbate pain perception and diminish the effectiveness of coping mechanisms, thereby increasing the severity of dysmenorrhea symptoms in this population.[16]

The majority of respondents in this study experienced moderate dysmenorrhea, consistent with the findings of Andriani, et al[17] which reported that late adolescents predominantly experienced moderate dysmenorrhea, followed by mild and severe dysmenorrhea. The dysmenorrhea-related pain reported by respondents affected their daily activities to varying degrees, ranging from minimal disruption to severe impairment, preventing them from performing daily tasks. The on-

Table 2. Menstrual Cycle Patterns and Dysmenorrhea Severity

Menstrual Cycle Patterns	Dysmenorrhea Severity				p*
	Mild (n,%)	Moderate (n,%)	Severe (n,%)	Total	
Normal	47 (33.1)	69 (48.6)	26 (18.3)	142 (81.6)	
Polymenorrhea	2 (13.3)	9 (60.0)	4 (26.7)	15 (8.6)	0.031
Oligomenorrhea	4 (23.5)	4 (23.5)	9 (52.9)	17 (9.8)	
Total	53 (27.6)	82 (42.7)	39 (20.3)	174 (100)	

* Chi-Square Fisher's exact test

set of dysmenorrhea typically occurred at the beginning of menstruation and lasted for one day, aligning with the findings of Wrisnijati, et al[18] where 58.5% of respondents reported experiencing pain only on the first day of menstruation, and 56.1% noted that pain began sometime after the onset of menstrual bleeding.

The majority of participants in this study had regular menstrual cycles, consistent with findings from a study by Suhri, et al[19] on undergraduate nursing students reported that most students had regular menstrual cycles, with only a small percentage experiencing

thereby extending the menstrual cycle duration. Therefore, there is a strong association between PCOS and menstrual cycle irregularities.[19,20] Previous research have also established an association between polymenorrhea and an increased incidence of endometriosis, highlighting the impact of menstrual cycle patterns on reproductive health.[21-3]

Regarding coping strategies, the majority of research participants experiencing dysmenorrhea employed positive and adaptive mechanisms. This finding aligns with research by Oktaviana, et al[24] on nursing undergraduate students, which reported that 82% of students

Table 3. The Association between Coping Mechanisms and the Improvement of Dysmenorrhea Severity

Coping mechanism	Improvement of Dysmenorrhea Severity			p*
	Yes (n,%)	No (n,%)	Total (n,%)	
Adaptive	89 (54.6)	74 (45.4)	163 (93.6)	0.0001
Maladaptive	4 (36.4)	7 (63.3)	11 (6.4)	
Total	93 (48.4)	81 (42.2)	174 (100)	

* Chi-Square Fisher's exact test

menstrual irregularities. These irregularities were associated with various factors, including stress. Medical students are exposed to high levels of stress due to academic workload, demanding class schedules, and parental expectations. A previous study also demonstrated that female students experiencing stress had a 4.7-fold increased risk of developing irregular menstrual cycles.[20]

Menstrual cycle regularity is significantly influenced by reproductive organ disorders. In this study, two subjects with endometriosis had regular menstrual cycles, while four subjects with polycystic ovary syndrome (PCOS) exhibited oligomenorrhea. These findings indicate that menstrual cycle irregularities can be attributed to underlying reproductive health conditions. Hyperandrogenemia, a common condition in PCOS patients, may disrupt ovarian maturation (ovulation),

utilized adaptive coping strategies, while 18% relied on maladaptive strategies. Similarly, a study by Purnomo M, et al[25] also found that 55.4% of subjects adopted adaptive coping mechanisms, whereas 44.6% used maladaptive coping mechanisms. In contrast, Prawoto E, et al[26] study on high school students revealed that 46.6% employed adaptive coping strategies, whereas a higher proportion (63%) engaged in maladaptive coping strategies. These variations may be attributed to age and level of knowledge, which influence coping behavior.[26] Fatima, et al[27] reported that medical students demonstrate a good understanding of pain management and coping techniques, which influences their experience of dysmenorrhea. These findings underscore differences in knowledge levels between health and non-health students, highlighting the impact of age on pain tolerance and psychological maturity

in coping with dysmenorrhea.

The severity of dysmenorrhea among UMY medical students in this study was found to be significantly associated with menstrual cycle regularity (p=0.031), with severe dysmenorrhea being more prevalent among individuals with oligomenorrhea. These results support the study by Wardani, et al[28] which identified a correlation between irregular menstrual cycles and the incidence of primary dysmenorrhea. Female students with irregular menstrual cycles are 14.88 times more likely to experience primary dysmenorrhea than those with regular cycles. Similarly, research by Juliana, et al[29] found that irregular menstrual cycles contribute to the likelihood and intensity of primary dysmenorrhea. However, another study reported no significant association between dysmenorrhea severity and menstrual cycle irregularity.

According to research, 50% of subjects with oligomenorrhea menstrual cycles also experienced severe dysmenorrhea. Similarly, a study by Juliana, et al[29] on female high school students found that 52.6% of respondents with oligomenorrhea reported severe pain, while 37.9% of those with polymenorrhea experienced moderate pain. This association is attributed to oligomenorrhea being a menstrual disorder frequently caused by hormonal imbalances.

However, subjects with normal menstrual cycles may also exhibit a high prevalence of moderate to severe dysmenorrhea. Possible contributing factors include excessive prostaglandin production, which intensifies uterine contractions and pain, leading to ischemia from reduced blood flow. Chronic inflammation, hormonal imbalances, and psychological stress may further exacerbate symptoms. Additionally, underlying gynecological conditions such as endometriosis, adenomyosis, and uterine fibroids can cause severe dysmenorrhea, even in individuals with regular cycles, due to structural and functional uterine changes.[30]

This study also found a significant correlation between coping mechanisms and dysmenorrhea severity. A considerable number of respondents who employed adaptive coping strategies experienced reduced pain levels, from severe to moderate and from moderate to mild. These findings suggest that adaptive coping is more effective in alleviating dysmenorrhea compared to maladaptive strategies. Previous research also supports a link between coping mechanisms and emotional regulation in female medical students with dysmenorrhea.[31] However, several other studies have reported conflicting results, likely due to variations in knowledge and experience among respondents.[32,33] Research suggests that higher levels of knowledge about dysmenorrhea are associated with the adoption of more adaptive coping mechanisms.[34]

Beyond coping strategies, multiple factors shape an individual's response to dysmenorrhea. While adaptive coping helps alleviate distress, no study confirms it as the sole effective management approach.[33] Many women remain unaware of proper coping strategies, often relying on maladaptive methods under the assumption that dysmenorrhea resolves naturally. Therefore, coping mechanisms play a crucial role in managing both external and internal stressors, which can help prevent, mitigate, or regulate emotional distress associated with dysmenorrhea. Consequently, adopting constructive and proactive behaviors is essential for effectively addressing dysmenorrhea.[35]

This study has limitations in controlling certain confounding factors, particularly stress levels, physical activity, and the duration and intensity of menstruation. The exclusion of these variables from the study design or statistical analysis as covariates may influence the validity of the findings regarding the relationships among the examined variables.

Further research is necessary to explore various aspects related to this subject. First, interventions should be developed and tailored to different age groups and educational backgrounds to ensure that all women receive appropriate support and information. Such interventions would help address the diverse needs and experiences of individuals suffering from dysmenorrhea. Additionally, conducting longitudinal studies is essential to examine the long-term effects of adaptive and maladaptive coping mechanisms on dysmenorrhea. These studies would provide valuable insights into the effectiveness and sustainability of different coping strategies over time, ultimately contributing to improved dysmenorrhea management.

Conclusion

The menstrual cycle pattern of FKIK UMY medical students in 2019 to 2021 was found to be associated with the severity of dysmenorrhea. Dysmenorrhea severity was increased in subjects with longer interval of the menstrual cycle (oligomenorrhea) com-

pared to normal and shorter interval of cycle. Furthermore, there is a statistically significant association between dysmenorrhea severity and coping strategies, with adaptive coping being demonstrating greater effectiveness in reducing dysmenorrhea-related discomfort among FKIK UMY medical students during the study period.

Conflicts of Interest

All authors declare no conflict of interest

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