



RESEARCH ARTICLE

Factors Related to Primary Dysmenorrhoea in Students at The Faculty of Medicine of Andalas University in 2023

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Abstract

Introduction: Dysmenorrhoea or menstrual pain is a commonly reported reproductive health issue, particularly affecting those aged 18-25 years. It can significantly disrupt daily activities and reduce productivity. The high prevalence of dysmenorrhoea is attributed to multiple factors, which are multifactorial in nature. The research aims to identify the factors related to incidence of primary dysmenorrhoea among in students of the Bachelor of Medical Education Study Program at the Faculty of Medicine, Andalas University 2023.

Method: A cross-sectional study was conducted in October 2023 using a Google form to collect primary data. The sample consisted of 212 female students from the batch of 2020-2022, selected using a simple random sampling technique. Univariate and bivariate analyses were used to analyse the data, with the chi-square test employed in bivariate analysis.

Results: The results of the study of the relationship between age of menarche, family history of sleep quality, and duration of menstrual bleeding, the incidence of primary dysmenorrhoea obtained p values of $p = 0.538$, $p = 0.059$, $p = 0.004$, and $p = 1.000$.

Conclusion: There is a significant relationship between sleep quality and the incidence of primary dysmenorrhoea. However, there is no significant relationship between menarche age, family history, and duration of menstrual bleeding with the incidence of primary dysmenorrhoea in students of the Bachelor of Medical Education Study Program at the Faculty of Medicine, Andalas University 2023. It is important for all women of childbearing age to be aware of the risk factors that cause dysmenorrhoea and the measures taken to alleviate menstrual pain.

Keywords: Dysmenorrhoea, age at menarche, family history, sleep quality, duration menstrual bleeding

INTRODUCTION

Adolescent reproductive health is an issue global concern. Reproductive health encompasses all aspects of reproduction, including secondary sexual development such as softer voice, hair growth in certain areas, larger breasts and hips, and menstruation. It is important to note that reproductive health is not limited to sexuality, but rather affects all aspects of reproductive well-being.¹ According to a study conducted in the United States, 75% of reproductive health issues are related to menstrual problems, with dysmenorrhea being a commonly reported issue.²

Dysmenorrhea is characterized by pain resulting from dysrhythmic contractions of the myometrium, leading to cramping in the lower abdomen. It is often accompanied by other symptoms, such as sweating, headache, nausea, vomiting, diarrhea, and tremors. Dysmenorrhoea is characterized by pain and discomfort before or during menstruation and common condition among young women aged 18-25 years, but tends to decrease with age.^{3,4} There are two types of dysmenorrhoea: primary dysmenorrhoea without pelvic pathology and secondary dysmenorrhoea associated with pelvic pathology.⁵

The prevalence of dysmenorrhea varies greatly from one country to another, affecting around 50-90% of women worldwide.⁶ According to the World Health Organization (WHO), approximately 1,769,425 women (90%) experience dysmenorrhea.⁷ In the United States, the prevalence is 59.7%, with 49% experiencing mild dysmenorrhea, 37% experiencing moderate dysmenorrhea, and 12% experiencing severe dysmenorrhea.² The prevalence of dysmenorrhea in Indonesia is approximately 64.25%. Of this, primary dysmenorrhea accounts for around 54.89% and secondary dysmenorrhea accounts for around 9.36%.⁸ The prevalence is similar to that reported in West Sumatra, where 57.3% of women reported pain during menstruation, including 9% with severe dysmenorrhea, 39% with moderate dysmenorrhea, and 52% with mild dysmenorrhea.⁹

Women who experience prolonged and continuous menstrual pain may reduce physical activity due to pain, lack of confidence, and difficulty concentrating. This indicates that primary dysmenorrhea can significantly disrupt daily activities.^{4,10} Another study mentioned that dysmenorrhea is more prevalent in unmarried women and at a young age, possibly due to higher stress levels from school and work.¹

The high incidence of primary dysmenorrhea is caused by various factors and characteristic features.⁴ Risk factors for primary dysmenorrhea include early menarche (less than 12 years old), family history of dysmenorrhea, poor sleep quality, bleeding duration of more than 7 days, long menstrual cycles, lack of physical activity, body mass index, exercise, smoking, alcohol and caffeine consumption, and stress.^{4,11}

According to global studies, poor sleep quality is prevalent worldwide, with rates ranging from 15.3% to 39.2%.⁷ According to the Ministry of Health of the Republic of Indonesia, individuals between the ages of 18 and 40 require approximately 7-8 hours of sleep per night. Failure to meet this requirement can have physiological consequences, including menstrual disorders.¹² However, a study showed that university students and young adults have poor sleep quality at a percentage of

around 19.7-57.5% and it was found that medical students had the highest percentage.³ Based on these problems, researchers aim to investigate the potential correlation between menarche age, family history, sleep quality, and duration of menstrual bleeding with the incidence of primary dysmenorrhea in female students of the Bachelor of Medical Education Study Program at the Faculty of Medicine, Andalas University 2023.

METHODS

This is an observational analytic research with a cross-sectional study approach. The study aims to investigate the relationship between menarche age, family history of dysmenorrhea, sleep quality, and duration of menstrual bleeding with the incidence of primary dysmenorrhea in students of the Medical Education Study Program at the Faculty of Medicine, Andalas University in 2023.

The study employed a simple random sampling technique for sample selection. This method ensures that each member or unit of the population has an equal chance of being selected. The sample consisted of 212 female students out of 482 female students from 2020- 2022 who met the inclusion and exclusion criteria. This study's inclusion criteria are limited to female students who are currently active in the 2020-2022 batch and willing to participate as respondents. Exclusion criteria include students with a history of gynecological or obstetric disorders, such as ovarian tumors, ovarian cysts, endometriosis, or pelvic inflammation.

Data collection was performed using a questionnaire distributed through Google Forms. The questionnaire included questions about availability to participate, personal identity, and variables studied, such as dysmenorrhea, degree of dysmenorrhea, age of menarche, family history, sleep quality, and duration of menstrual bleeding. The data collected was categorical and analyzed using univariate and bivariate methods. The bivariate analysis employed the Chi- Square test to establish the relationship between the dependent and independent variables in this study.

RESULT AND DISCUSSION

Table 1 shows that the majority of respondents in this study were 21 years old (39.6%), with only 0.5% aged between 17 and 23 years. This research also found that 91.5% of respondents experienced primary dysmenorrhea, 72.7% experienced mild dysmenorrhea, 82.1% experienced menarche at a normal age, 62.3% had a family history of dysmenorrhea, 90.1% had poor sleep quality, and 88.2% experienced menstruation with a normal duration.

Table 1. Characteristic Respondents

Characteristic	Frequent	Percentage (%)
Age		
17	1	0.5
18	3	1.4
19	36	17.0
20	64	30.2
21	84	39.6
22	23	10.8
23	1	0.5
Primary Dysmenorrhea		
Yes	194	91.5
No	18	8.5
Severity of Dysmenorrhea		
No Pain	18	8.5
Mild	152	72.2
Moderate	38	17.9
Severe	3	1.4
Age at Menarche		
Early	38	17.9
Normal	174	82.1
Familial History		
Yes	132	62.3
No	80	37.7
Quality Sleep		
Poor	191	90.1
Good	21	9.9
Duration of Menstrual Bleeding		
Exceeds Normal	191	90.1
Normal	21	9.9

Table 2 shows that dysmenorrhea is more prevalent among respondents with a normal menarche age (92%) compared to those with an early menarche age (89.5%). The statistical test (chi-square) results indicate that there is no significant relationship between the age of menarche and the incidence of primary dysmenorrhea (p-value=0.538, p-value>0.05).

Table 2 shows that respondents with a family history of dysmenorrhea (94.7%) experience dysmenorrhea more frequently than those without such a history (86.3%). The statistical test (chi-square) results indicate that there is no significant relationship between family history of

dysmenorrhea and primary dysmenorrhea (p-value=0,059, p-value>0.05). The data indicates that primary dysmenorrhea tends to occur in respondents with a family history of dysmenorrhea.

Table 2. Factors Related To Incidence of Primary Dysmenorrhea

Dependent Variable	Dysmenorrhea				Total		<i>P-value</i>
	Yes		No		N	(%)	
	n	(%)	n	(%)			
Age at Menarche							
Early	34	89,5%	4	10,5%	38	100%	0,538
Normal	160	92,0%	14	8,0%	174	100%	
Family History							
Yes	125	94,7%	7	5,3%	132	100%	0,059
No	69	86,3%	11	13,8%	80	100%	
Sleep Quality							
Poor	179	93,7%	12	6,3%	191	100%	0,004
Goof	15	71,4%	14	28,6%	21	100%	
Duration of Menstrual Bleeding							
Exceeds Normal	23	92,0%	2	8,0%	25	100%	1,000
Normal	171	91,4%	14	8,6%	187	100%	

Table 2 shows that respondents with poor sleep quality (93.7%) experience dysmenorrhea more frequently than those with good sleep quality (71.4%). The statistical test (chi-square) results indicate that the p-value was 0.04 (p-value<0.05), there is significant relationship between sleep quality and the incidence of primary dysmenorrhea.

Table 2 shows that dysmenorrhea was more prevalent among respondents with a duration of bleeding during menstruation that exceeded normal (92.0%) compared to respondents with a normal duration of bleeding during menstruation (91.4%). The statistical test (chi-square) results indicate a p-value of 1.000 (p-value>0.05). There is no significant relationship between the duration of bleeding during menstruation and the incidence of primary dysmenorrhea in female students of the Bachelor of Medical Education Study Program at the Faculty of Medicine, Andalas University in 2023.

The study found that 91.5% of female students experienced primary dysmenorrhoea, while only 8.5% did not. The study's findings are consistent with those of Afiati et al. (2023) in female students of the Mulawarman University Medical Study Programme. The prevalence of dysmenorrhoea was found to be high at 79.2%. The majority of cases occurred in women aged 17-23 years, with the highest prevalence in those aged 20 years. This study explains that the incidence of dysmenorrhoea is often higher among individuals aged 16-25 years and decreases among those aged 30-35 years.¹³ The result also shows a high prevalence of dysmenorrhoea among individuals aged 17-23 years, with the majority being 20 years old in this study.

The majority of female students experienced mild degree of dysmenorrhoea at 72.2%, 17.9% of female students experienced moderate degree of dysmenorrhoea, and only 1.4% of female students experienced severe degree of dysmenorrhoea. These results are consistent with Pundati et al.'s (2016) research on female students in their seventh semester at Unsoed Puwokerto. The data obtained from interviews showed that 49.4% of female students experienced a mild degree of dysmenorrhoea, which was the highest among the four categories. Furthermore, the study revealed that 16.5% of female students experienced moderate dysmenorrhoea, while only 1.2% reported severe dysmenorrhoea.¹⁴ These findings differ from those of Lubis et al. (2023), who reported that 68.8% of respondents experienced moderate dysmenorrhoea and only 10% experienced mild dysmenorrhoea. This study utilised the Numeric Rating Scale, which differs from the Mankoski pain scale used in this study.¹⁵ It is important to note that individuals may have varying perceptions of pain, making it a subjective experience. Furthermore, primary dysmenorrhoea symptoms may worsen after five years of menarche.¹⁶

The study results indicate that 82.1% of female students who experienced menarche at or after the age of 12 were considered normal. This study aligns with the research conducted by Fatmawati et al. (2020), which found that 75.3% of the total respondents experienced menarche at a normal age, compared to 24.7% who experienced an earlier age of menarche. The age of menarche varies for each individual, and there is a tendency to experience menarche earlier each year, which can cause menstrual disorders such as dysmenorrhea.¹⁷ The age of menarche varies for each individual, and there is a tendency to experience menarche earlier each year, which can cause menstrual disorders such as dysmenorrhea.¹⁸ The age of menarche is influenced by BMI, with women having a high BMI experiencing earlier menarche and those with a low BMI experiencing later menarche.¹⁹ Nutritional status can also affect the onset of puberty and development by decreasing FSH and LH secretion.²⁰ Furthermore, exposure to audio-visual stimuli labeled as adult or vulgar can accelerate the maturation of the genital and reproductive system, leading to early menarche.²¹

According to the statistical tests presented in Table 2, there was no significant relationship found between the age of menarche and the incidence of primary dysmenorrhea in female students of the Medical Education Study Program at the Faculty of Medicine, Andalas University in 2023. The p-value of 0.538 (p-value > 0.05) supports this conclusion. These findings align with Afitati et al.'s (2023) research on FK UPN Veteran Jakarta students, which demonstrated a non-significant correlation between age at menarche and the prevalence of dysmenorrhea ($p > 0.05$, $p = 0.228$).¹³

Early menarche (<12 years old) can be a risk factor for dysmenorrhea. This is due to the cervical organ narrowing during this stage of reproductive system development, which is not optimal for menstruation.¹⁷ Shrotiya revealed that there is a significant correlation between early onset of menstruation and increased incidence of dysmenorrhea, likely due to longer exposure to prostaglandins resulting in more frequent uterine contractions.²²

The findings of this study contrast with those of Nurwana et al. (2017), who reported a correlation between early menarche (≤ 12 years) and the occurrence of primary dysmenorrhea.¹

Discrepancies in results may be attributed to variations in the indicators used to collect data on menarche age, which can differ across studies. Additionally, variations in study outcomes may also be attributed to potential differences in prostaglandin hormone production among individual women.^{13,23}

Table 2 shows that 62.3% of female students had a family history of dysmenorrhea, compared to 37.7% who did not. This finding is consistent with Septiyani et al.'s (2021) research, which found that 58.0% of respondents with a family history of dysmenorrhea had experienced it, compared to 42% of those without.²⁴

Family history refers to the genetic factors that contribute to a person's traits and characteristics, which are often similar to those of their parents. Additionally, offspring typically share similar physiology and anatomy with their parents. This is supported by the statement that two out of three women who experience dysmenorrhea have a family history of dysmenorrhea.⁸ Genetics are self-duplicating, meaning that during cell division, the mother's traits are passed down to her offspring. Research suggests that there may be a correlation between family history and the risk of dysmenorrhea. It is possible that shared lifestyle factors within families may contribute to this risk. Therefore, individuals may be able to reduce their risk of dysmenorrhea by adopting a different lifestyle pattern than their family members, even if there is a history of dysmenorrhea in their family or vice versa.¹⁰

According to the statistical test results presented in table 5.9, there was no significant relationship found between family history and the incidence of primary dysmenorrhea in female students of the Medical Education Study Program at the Faculty of Medicine, Andalas University in 2023. The p-value of 0.059 (p-value>0.05) indicates this lack of significance. The study's results align with those of Fatmawati et al. (2020). In their research on 40 female students at STIKes Madani Yogyakarta, statistical tests found no significant relationship between a family history of dysmenorrhea and the incidence of primary dysmenorrhea (p-value = 0.194, p-value > 0.05). The study found that female students with a family history of 90% were more likely to complain of dysmenorrhea compared to female students without a family history, who experienced dysmenorrhea at a rate of 72.2%.¹⁰ These results are consistent with the findings of this study, which showed that 94.7% of female students with a family history experienced dysmenorrhea, while 86.3% of female students without a family history experienced dysmenorrhea.

The findings of this study differ from those of Ammar (2016) who found a relationship between the history of dysmenorrhea in the family and the incidence of primary dysmenorrhea in women of childbearing age (15-35 years) with a p-value of 0.006. In contrast, this study found that the majority of respondents with a family history experienced dysmenorrhea (87.8%) compared to those without a family history (53.8%).²³

According to the research findings presented in Table 1, 90.1% of the students had poor sleep quality, while only 9.9% had good sleep quality. These results are consistent with the study conducted by Farahdilla et al. (2021) on 72 medical students from Mulawarman University, which found that 87.8% of the students had poor sleep quality and only 12.2% had good sleep quality.²⁵

Most of the students may experience poor sleep quality. This is confirmed by the fact from the results of the study which said that there are things that interfere with the sleep time of students, including noise from neighbors, use of electronic devices at night, coursework, overthinking, anxiety, and sleep paralysis.⁸ Additionally, medical students are at a higher risk of sleep deprivation compared to non-medical students due to the demanding nature of their academic programs, longer study duration, high study intensity, and assignments that affect their sleep habits.²⁶

Based on the results of statistical tests in table 2, it was found that there was a significant relationship between sleep quality and the incidence of primary dysmenorrhea in female students of the Medical Education Study Program of the Faculty of Medicine, Andalas University in 2023 with a p-value of 0.04 (p-value <0.05). These findings are consistent with Yudhanti et al.'s (2014) research, which demonstrated a significant correlation between sleep quality and primary dysmenorrhea in Sebelas Maret University's Faculty of Medicine students (p < 0.05, p-value = 0.001).²⁷

Poor sleep quality can have a significant impact on health, including motor impairment, decreased cognitive function, confusion, irritability, decreased motivation, increased sensitivity to pain, and other negative effects.⁷ A study by Hack et al. on healthy volunteers found that reducing sleep time by four hours was associated with an increase in prostaglandins and inflammatory agents, such as IL-6 and TNF- α , which can trigger pain.³ Similarly, a study by Smith et al. showed that continuous sleep deprivation can damage endogenous pain inhibitors and increase spontaneous pain, contributing to chronic pain in sleep disorders.¹²

According to a study by Woosley et al., women with insomnia experience more severe menstrual pain than those without insomnia. This is because sleep disturbance increases pain sensitivity, leading to an increase in dysmenorrhea complaints.³ Additionally, poor sleep quality can reduce serotonin levels in the body, which can increase anxiety, sensitivity to pain, and depression.²⁸

The results of this study showed that the majority of respondents with poor sleep quality experienced primary dysmenorrhea (93.7%) and showed a significant relationship between sleep quality and the incidence of primary dysmenorrhea. The study's findings align with Afiati et al.'s (2023) research, which demonstrates a significant correlation between sleep quality and dysmenorrhea incidence (p-value <0.05). Specifically, 89.5% of respondents who reported poor sleep quality also experienced dysmenorrhea.¹³ Delistiani et al. (2019) also found similar results, concluding that an increase in poor sleep quality is associated with a higher incidence of dysmenorrhea.¹²

Based on the results of the study, data were obtained that female students who had a duration of menstrual bleeding that exceeded the norm by 11.8% and female students who had a normal duration of menstrual bleeding by 88.2%. These findings align with Afiati et al.'s (2023) research on medical students at UPN Veteran Jakarta. The majority of female students (88.3%) experienced a normal menstrual duration, while a minority (11.7%) experienced an abnormal duration.¹³

Menstrual duration is the length of time from the first day of menstruation until menstrual bleeding stops, typically lasting 3-7 days, with a blood volume of ≤ 80 ml.²⁹ Excessive menstrual bleeding, known as hypermenorrhea, is often associated with endocrine disorders and can be caused by inflammatory disorders, tumors in the uterus, hormonal changes during the menstrual cycle, and emotional disorders that can affect menstrual bleeding.¹⁶ Furthermore, a separate study identified abnormal uterine bleeding (AUB) as a contributing factor. The study also found that heavy menstrual bleeding (HMB) was more prevalent in adolescents (37%) than in adults (10-20%).³⁰

According to the statistical tests presented in Table 2, there was no significant relationship found between the duration of menstrual bleeding and the incidence of primary dysmenorrhea in female students of the Medical Education Study Program at the Faculty of Medicine, Andalas University in 2023. The p-value was 1.000 (p-value>0.05). The study's results align with Afitati et al.'s (2023) research, which found no correlation between menstruation length and dysmenorrhea incidence in these students (p-value>0.05). That study revealed that only 7 female students with abnormal menstrual duration experienced primary dysmenorrhea (77.8%) compared to 54 female students with normal menstrual duration (79.4%). The study suggests that meaninglessness may occur due to abnormal length of menstruation experienced by only a few respondents.¹³

Menstrual bleeding duration is measured by the average number of days a woman menstruates per month. If the duration of menses is longer than 7 days, the uterus will contract more often and produce more prostaglandins, which can cause excessive pain during menstruation. If the duration of menses is longer than 7 days, the uterus will contract more often and produce more prostaglandins, which can cause excessive pain during menstruation.²⁹ Excessive pain during menstruation can be caused by high levels of prostaglandin hormone. Women with primary dysmenorrhea experience high intrauterine pressure and prostaglandin levels twice during the menstrual cycle. This can lead to irregular and uncoordinated contractions caused by prostaglandins, which are more common if the duration of bleeding is extended.²³

In contrast to several other studies that show things that are in line with the theory regarding the relationship between the length of menstruation and the incidence of primary dysmenorrhea. The research was found in a study by Nurwana, et al (2017) which divided the length of menstruation into 2 indicators, namely high risk (≥ 7 days) and low risk (< 7 days). The results showed a significant relationship between the length of menstruation and the incidence of primary dysmenorrhea with a p-value of 0.043 (p-value < 0.05). Observations were also made in the study which showed that this association could be caused by lifestyle changes that affect the length of menstruation.¹ These results are different from the results in this study by using indicators on normal menstrual duration with ≤ 7 days. Apart from the difference in results, the indicators applied in each study can also affect the results in the study.

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CONCLUSION

Based on the results of the research conducted, it can be concluded that there is a relationship between sleep quality and the incidence of primary dysmenorrhoea. However, there was no relationship between the variables of menarche age, family history, and duration of menstrual bleeding with the incidence of primary dysmenorrhoea in female students of the Medical Education Study Programme of the Faculty of Medicine, Andalas University in 2023. The suggestion is the need for every woman to know and pay attention to risk factors and prevention efforts related to dysmenorrhoea, such as paying attention to good sleep quality, maintaining good nutritional status, stress management, exercise and adequate physical activity.

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