



Prevalence of Dysmenorrhea and its Associated Factors among 11th and 12th Grade Female Students in Kathmandu Metropolitan City, Nepal

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ABSTRACT

Background: Dysmenorrhea is a common health issue affecting 50-90% of adolescent girls, significantly impacting their quality of life by causing absenteeism from school and affecting daily activities. Understanding the impact of dysmenorrhea is essential for carrying out focused treatment. This study aims to investigate the prevalence of dysmenorrhea among students in classes 11-12 in the Kathmandu Metropolitan area.

Methods: A non-experimental, descriptive cross-sectional study was conducted involving female students from private secondary schools in Kathmandu Metropolitan. Using a multistage random sampling technique, 427 students were surveyed with a self-administered structured questionnaire. Data were analysed using descriptive and analytical statistics.

Results: The study found 79.4% prevalence of dysmenorrhea among participants, with 71.2% experiencing regular menstrual cycles and 28.8% having irregular cycles. Early menarche (<13 years) was associated with significantly higher odds (AOR = 1.709; 95% CI: 1.035 - 2.822; p = 0.036). Aged ≤16 years had significantly higher odds of experiencing dysmenorrhea (AOR = 2.362; 95% CI: 1.418 - 3.932; p < 0.001). Having a family history of dysmenorrhea was strongly associated with its occurrence (AOR = 8.21; 95% CI: 4.22 - 15.99; p < 0.001), suggesting familial predisposition is a major determinant of menstrual pain.

Conclusion: Dysmenorrhea is highly prevalent among adolescent girls in Kathmandu, with key factors such as age, early menarche and family history significantly impacting its prevalence. The study underscores the need for targeted interventions to manage dysmenorrhea and improve the quality of life for affected individuals.

Keywords: Adolescent, Dysmenorrhea, Female, Nepal, Menstrual Cycle, Prevalence

BACKGROUND

Dysmenorrhoea is the most frequently encountered gynaecological complaint, and about 80% of post-pubertal pubescent girls have it. Primary dysmenorrhea is characterised by painful uterine cramps, near and during menstruation, that have an impact on personal life and productivity (1). Dysmenorrhea is of two types: primary, caused by prostaglandin

secretion during menstruation, and secondary type, caused by the visible pelvic lesion (2). The two types: are primary dysmenorrhea, which occurs without any underlying pathology, and secondary dysmenorrhea, linked to reproductive disorders such as endometriosis (3,4) menstrual characteristics and related symptoms. Descriptive bivariate analysis and binary logistic regression

were performed in which the dependent variable was secondary dysmenorrhea. The prevalence of dysmenorrhea was 73.8% (of which 63.3% had primary dysmenorrhea and 10.5% had secondary dysmenorrhea). Among adolescents, primary dysmenorrhea is most prevalent, typically appearing within six months to two years after menarche, as regular ovulatory cycles are established (5).

The prevalence of dysmenorrhea among adolescent girls ranges from 50% to 90%, with a wide range of severity (6–8). Several factors contribute to the intensity of menstrual pain, including early menarche, family history of dysmenorrhea, and sedentary lifestyles (9,10). Early onset of menstruation, typically between ages 10 and 12, has been associated with more severe cases due to prolonged exposure to hormonal changes (11) the prevalence of dysmenorrhea and self-monitoring of the cycle in students from Lisbon region, and explore the effect of chronological age, age at menarche and body mass index (BMI).

Dysmenorrhea profoundly affects the daily activities and quality of life of adolescent girls, contributing to absenteeism from school, diminished academic performance, and a reduction in physical activity. Sleep patterns are also significantly impacted, with many girls experiencing reduced sleep quality and duration, which worsens the perception of pain and increases daytime fatigue (7,12,13). This, in turn, leads to psychological stress, forming a vicious cycle where pain, poor sleep, and reduced exercise reinforce one another.

Despite the high prevalence and serious impact on adolescent girls' lives, dysmenorrhea remains an under-recognised condition, often inadequately treated. Understanding its burden is essential for developing targeted interventions that improve menstrual health and overall well-being. This study aims to assess the prevalence of dysmenorrhea among students in classes 11-12 in the Kathmandu Metropolitan area, shedding light on its effects on their daily lives and academic performance.

METHODS

The study was conducted in Kathmandu Metropolitan City, situated in Kathmandu district of Nepal, which is a rapidly expanding urban center with an estimated population of 2041587 (14). The city serves as both Nepal's capital and biggest city. From August to December 2019, an institution-based cross-sectional study was carried out among eligible female students in grades 11-12 from private secondary schools in Kathmandu Metropolitan City. The study included only private schools, due to difficulty of obtaining gatekeeper consent from government school, despite multiple attempts. The study included 427 young

female students. A multi-stage basic random sampling technique was used. A lottery was used to select ten wards at random among Kathmandu Metropolitan's 32 wards. A private secondary school was chosen from each of these ten wards by a lottery. Students were randomly selected from each school based on their roll numbers. This strategy recruits people progressively based on their availability and willingness to join. We recruited participants from ten schools who were in grades 11-12 and menstruating.

A questionnaire was pretested among 10% of the sample (43 students) to identify and correct ambiguities and inconsistencies, followed by literature review prior to field administration. A self-administered questionnaire was used to gather data for this investigation. The questionnaire, developed after a thorough literature review, had three sections: demographic information, wealth quintile, and dysmenorrhea details. Section A covered personal demographics, Section B recorded asset ownership, and Section C focused on menstrual characteristics and pain management.

The researcher used a self-designed, structured questionnaire for data collection, which students completed independently, with assistance available for difficult questions. Before the commencement of the study, written assent was obtained from students under 18, and consent was taken from both students above 18 years and their parents. Participants were informed that their participation in the study was entirely voluntary and that they might leave at any time. All gathered data was meticulously kept anonymous and confidential, according to the Declaration of Helsinki's ethical guidelines. Female teachers, trained for the process, distributed the questionnaires in sealed envelopes to ensure privacy. Students were allowed to complete the questionnaires at home and return them to school, promoting honest and accurate responses.

The research ethical clearance was obtained from the Ethical Review Board (ERB) of Nepal Health Research Council with the reference number (Reg. no. 723/2019).

The collected data were reviewed for completeness and coded before being entered into a secure database using Epi-Data v3.1. To ensure accuracy, 10% of the data entries were randomly cross-checked, and backups were stored on an external hard drive. Data were analysed using the SPSS software, with descriptive statistics such as counts, percentages, and cross-tabulations used for presentation. The data were summarised using descriptive statistics (mean, median, mode, SD, minimum, maximum) for continuous variables and frequencies and percentages for categorical variables. The associations between dysmenorrhea and demographic and obstetric factors were examined using chi-square tests and multivariate logistic regression was applied to compute adjusted

odds ratios (AOR), with statistically significant set at $p < 0.05$, while instrument reliability was assessed using Cronbach's alpha.

RESULTS

A total of 427 students were approached for participation; all participants agreed to participate, resulting in a response rate of 100% indicating socio-demographic characteristics. The mean age of the participants was 16.41 years, with a standard deviation of ± 0.871 . A significant portion (82.9%) resided in urban areas. The ethnic composition was 50.8% Brahmin/Chhetri and 40% Janjati, with 85.7% identifying as Hindu. Most participants (63%) were from nuclear families, and fathers had higher education levels compared to mothers. Fathers were primarily engaged in business (32.6%), while 56.2% of mothers were housewives, as illustrated in Table 1.

Table 1. Socio-demographic characteristics (n=427)

Characteristics	Frequency	Percent (%)
Age		
14-16	238	55.7
17-19	189	44.3
Mean \pm SD= 16.41 \pm 0.871 years minimum = 14years and maximum =19 years Median =16 and mode =16 years		
Permanent Residence		
Metropolitan	145	34.0
Sub Metropolitan	35	8.2
Municipality	174	40.7
Rural Municipality	73	17.1
Ethnicity		
Dalit	14	3.3
Janjati	171	40.0
Madhesi	21	4.9
Muslim	4	0.9
Brahmin/Chhetri	217	50.8
Religion		
Hindu	366	85.7
Buddhist	45	10.5
Muslim	2	0.5
Kirat	5	1.2
Christian	9	2.1
Family type		
Joint	129	30.2
Nuclear	269	63.0
Extended	29	6.8

Table 2 illustrates that the majority, 67.4%, preferred non-vegetarian food, while 24.6% followed a vegetarian diet, and 8% consumed junk food. Sleep patterns revealed that 48% of participants slept between 6 to 8 hours, 42.9% slept less than 6 hours, and 9.1% slept

more than 8 hours. Emotional problems were prevalent, with 91.6% reporting having such issues. Additionally, physical exercise was uncommon, with only 11.9% engaging in regular exercise, whereas 88.1% did not. In terms of cigarette smoking, 92% of participants did not smoke, while 8% were smokers.

Table 2. Lifestyle characteristics of the respondents (n=427)

Characteristics	Frequency (n)	Percent (%)
Dietary habit		
Vegetarian food	105	24.6
Non-Vegetarian food	288	67.4
Junk food	34	8.0
Sleep Cycle		
< 6hrs	183	42.9
6-8 hrs	205	48.0
> 8 hrs	39	9.1
Having an emotional problem		
Having	391	91.6
Not having	36	8.4
Physical exercise		
Yes	51	11.9
No	376	88.1
Cigarette Smoking		
Yes	34	8.0
No	393	92.0

71.2% of participants reported having a regular menstrual cycle, while 28.8% experienced irregular cycles. Most participants had a menstrual cycle lasting 4 days or more (76.6%), with only 23.4% having a shorter cycle. Dysmenorrhea was prevalent in 79.4% of the participants, with pain intensity categorised as mild in 30.1%, moderate in 44.8%, and severe in 25.1%. The majority of participants experienced pain during menstrual flow (49.2%), and pain often started one to two days before menstruation began (63.7%), Table 3.

Table 3. Menstrual-related information of participants (n=427)

Characteristics	Frequency (n)	Percent (%)
Menstrual Cycle		
Regular	304	71.2
Irregular	123	28.8
Days of Menstrual Flow		
< 4days	100	23.4
4-5 days	204	47.8
>5days	123	28.8
Dysmenorrhoea		
Yes	339	79.4

Characteristics	Frequency (n)	Percent (%)
No	88	20.6
Family History		
Yes	194	45.4
No	233	54.6
Pain		
Mild	135	30.1
Moderate	139	44.8
Severe	65	25.1
Initiation of Pain		
Before blood begins to flow	126	29.5
During menstrual flow	210	49.2
After the blood has stopped flowing	3	.7
Before blood begins to flow		
1 day	124	29.0
2 days	148	34.7
3 days	46	10.8
more than 3 days	21	4.9

Table 4 shows that the prevalence of dysmenorrhea was significantly higher among respondents who experienced menarche before age 13 had significantly higher odds of dysmenorrhea compared to those whose menarche occurred at or after age 13 (AOR = 1.709; 95% CI: 1.035 - 2.822; p = 0.036). Dysmenorrhea was more common in participants aged ≤ 16 had significantly higher odds of experiencing dysmenorrhea compared to those aged ≥ 17 years (AOR = 2.362; 95% CI: 1.418 - 3.932; p < 0.001), indicating that younger age is a strong predictor of menstrual pain. Participants with a family history of dysmenorrhea had substantially higher odds of experiencing dysmenorrhea compared to those without a family history (AOR = 8.21; 95% CI: 4.22 - 15.99; p < 0.001), indicating that familial predisposition is a powerful determinant of menstrual pain. Overall, factors such as menarche age, family history of dysmenorrhea and age were significantly associated with the outcomes, while factors like menstruation cycle, sleep patterns, and physical exercise menstruation days did not show strong statistical significance.

Table 4. Association between dysmenorrhea and different variables associated with respondents (n=427)

Variables	Dysmenorrhea		P value	AOR ((95% CI)
	Yes	No		
Ages				
≤ 16	175 (51.6%)	63 (71.6%)	<0.001	2.362 (1.418 - 3.932)
> 17 (Ref.)	164 (48.4%)	25 (28.4%)		1
Ethnicity				
Other Castes	142 (41.9%)	43 (48.9%)	0.239	331
Brahmin/Chhetri	197 (58.1%)	45 (51.1%)		
Family type				
Nuclear	207 (61.1%)	62 (70.5%)	0.10394	
Extended	132 (38.9%)	26 (29.5%)		
Religion				
Hindus	324 (95.6%)	87 (98.9%)	0.14781	
Other Religion	15 (4.4%)	1 (1.1%)		
Age of Menarche				
< 13 yrs	121 (35.7%)	19 (21.6%)	0.036	1.709 (1.035 - 2.822)
≥ 13 yrs (Ref.)	218 (64.3%)	69 (78.4%)		1
Menstruation Cycle				
Regular	242 (71.4%)	62 (70.5%)	0.86344	
Irregular	97 (28.6%)	26 (29.5%)		
Cycle of Menstruation				
< 4days	75 (22.1%)	25 (28.4%)	0.21479	
≥ 4 days	264 (77.9%)	63 (71.6%)		
Family History of Dysmenorrhea				
Yes	183 (54.0%)	11 (12.5%)	<0.001	8.21 (4.22 - 15.99)
No (Ref.)	156 (46.0%)	77 (87.5%)		1

DISCUSSION

Dysmenorrhea, characterised by severe menstrual cramps, is a prevalent and disruptive gynecologic condition affecting women of all ages. The findings of the current study, conducted in Kathmandu Metropolitan schools, reported a 79.4% prevalence of dysmenorrhea among adolescent girls. Similar findings were reported by Niradesh Baidhya (75.2%) (8), Mesfino Mammo (70%) (15), MoolRaj Kural (84.2%) (16), Sharefah Al-Matouq (85.6%). Comparatively lower incidences had been reported by Axel Mbvoumi Nloh (56.2%) (17) 16.8 to 81% of women are affected by dysmenorrhea. The present study was carried out at the Dschang Health District in order to determine the prevalence of dysmenorrhea and associated factors among women at child bearing age. Methods: a transversal community-based study was carried out from March to June 2018. Information regarding socio-demographic features, prevalence, factors associated with the dysmenorrhea and the effect of dysmenorrhea on daily activities were collected using structured questionnaire and data were analyzed using Epi Info version 7.1.3.3 Software. Results: a total of 637 women aged 12 to 50 years were interviewed in the present study. The mean body mass index was 25.94 with an average weight of 66.41 kilogram. Fifty six point twenty percent (56.20% and Amaka Onu (51.1%) (18). Adolescent girls and younger women tend to have higher rates of dysmenorrhea compared to older women.

In this study, early menarche (<13 years) was significantly associated with dysmenorrhea AOR = 1.709; (95% CI: 1.035 - 2.822), with 35.7% of participants reporting menarche before age 13. Whereas, the study done in Ethiopia on early menarche linked with an increased prevalence of dysmenorrhea showed AOR 4.10 (95% CI 1.21- 13.09), which is higher than the current study (19). Other research also shows the link between early menarche and increased dysmenorrhea risk (20,21) there are a limited number of studies about the frequency of primary dysmenorrhea (PD). However, studies on this relationship are mixed, as research from Iran and India did not find a significant association between menarche age and dysmenorrhea prevalence, highlighting variability in the findings across different populations (16,22). Studies indicate that earlier menarche is associated with a higher prevalence of dysmenorrhea, increasing the likelihood of menstrual pain and negatively impacting the quality of life and daily activities of adolescent girls and women (12).

More than half of the participants (55.7%) were aged ≤ 16 had higher significance of dysmenorrhea with AOR 2.362, (95% CI: 1.418 - 3.932). Early menarche might be the causing factor for dysmenorrhea among the young adolescents. Nearly half (45.4%) of the respondents had a family history of dysmenorrhea with AOR = 8.21 (95% CI: 4.22 - 15.99). The study done in Chitwan Nepal,

showed the association with lesser AOR = 2.786, (95% CI: 1.408-5.495) (5). Similarly different studies shows a strong link between positive family history, either from mothers or siblings, and an increased likelihood of dysmenorrhea in adolescent girls. (8,20,23–25) anxiety and embarrassment among female adolescents. The prevalence of dysmenorrhea worldwide ranges 15.8-89.5%, with higher prevalence rates reported among adolescent female. This study aimed to assess the prevalence of dysmenorrhea and its associated factors among adolescent girls studying in Council for Technical Education and Vocational Training (CTEVT). Nevertheless, another study's findings differ from the current one, which shows that just 17.39% of respondents had a positive family history (4) conducted from 1st Dec. 2012 to 31st Jan. 2013. The study was conducted in Kathmandu University School of Medical Sciences. A total of 184 participants consented for this study and each one was given a questionnaire to complete. This study included only unmarried nulliparous, healthy (all through first to final years).

The study's limitations include its focus on private schools in Kathmandu, which may not represent the broader population of Nepalese female students. The cross-sectional nature of the study limits its ability to determine causal links. Reporting bias might be introduced by the use of self-reported data. Additionally, the study did not assess students' pain thresholds, which limits the ability to gauge the severity of dysmenorrhea accurately. Future research should include a broader range of variables and a larger sample size based on different topography, education system to address these gaps and improve the understanding and treatment of dysmenorrhea.

CONCLUSION

Dysmenorrhea significantly impacts the daily lives of adolescent girls, contributing to absenteeism from school and a lower quality of life. This study highlights that early menarche, family history of dysmenorrhea, and young age groups are strongly associated with higher prevalence and severity of the condition. Addressing these factors through targeted intervention and improving management strategies can enhance the quality of life for affected individuals and mitigate the broader implications of dysmenorrhea. Further research is needed to explore effective treatment options and refine our understanding of this pervasive issue.

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Conflict of interest

The authors declare no conflict of interest.

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