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Prevalence of Menstrual Disorders and Their Association with Body Mass Index in Adolescent Nursing Students in Kathmandu, Nepal

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ABSTRACT

Background

Menstrual disorders are common among adolescents and may affect physical, psychological, and academic well-being. Body mass index (BMI) may influence menstrual patterns, but evidence remains inconsistent. This study aimed to assess the prevalence of menstrual disorders and their association with BMI among adolescent nursing students in Kathmandu, Nepal.

Methods

A descriptive cross-sectional study was conducted from October to November 2020 among 230 first- and second-year PCL nursing students from four CTEVT-affiliated campuses in Kathmandu. Cluster sampling was used. Data were collected using a self-administered questionnaire, and menstrual disorders were assessed based on self-reported history using predefined operational definitions. Height and weight were measured to calculate BMI using WHO Asian criteria. Data were analysed using SPSS version 23 using descriptive statistics and Pearson's Chi-square test; $p < 0.05$ was considered significant.

Results

The mean age of participants was 17.06 ± 1.15 years, and the mean age at menarche was 12.84 ± 1.25 years. Most students (76.5%) had regular cycles. Dysmenorrhea was most common (76.1%), followed by menorrhagia (31.3%), irregular menstruation (23.5%), oligomenorrhea (21.3%), and metrorrhagia (13.5%). Common premenstrual symptoms were anger/irritability (62.2%) and difficulty sleeping (52.2%). Most participants had normal BMI (67.4%), while 21.7% were underweight and 10.9% overweight. No significant association was observed between BMI and menstrual interval, dysmenorrhea, pain severity, metrorrhagia, or oligomenorrhea ($p > 0.05$).

Conclusions

Menstrual disorders, particularly dysmenorrhea, were highly prevalent. However, BMI was not significantly associated with menstrual characteristics. These findings highlight the need for menstrual health education and awareness programs in educational institutions.

Keywords: BMI; Dysmenorrhea; Menstrual Disorders; Oligomenorrhea; Adolescents; Nursing Students.

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INTRODUCTION

Menstrual cycles in adolescence are often irregular initially but stabilize over time.[1,2] Common menstrual disorders, including dysmenorrhea, menorrhagia, oligomenorrhea, and polymenorrhea, can negatively affect daily activities and school attendance.[3, 4] Dysmenorrhea affects 70-90% of adolescents and contributes to poor academic performance.[5] In Nepal, over half of adolescent girls report dysmenorrhea, and more than one-third experience irregular cycles.[6, 7] Body mass index (BMI), an indicator of nutritional status, may influence menstrual function, although evidence regarding its association with menstrual disorders remains inconsistent.[8-11] Nursing students may be particularly vulnerable because of academic stress, clinical training, irregular sleep, and lifestyle changes.[12-14] However, evidence among nursing students in Nepal regarding menstrual disorders and BMI remains limited.[12, 15-17] Therefore, this study aimed to determine the prevalence of menstrual disorders and their association with BMI among adolescent nursing students in Kathmandu.

METHODS

Study Area

The study was conducted in four PCL nursing campuses (HAMS Nursing College, Nepalese Army Institute of Health Sciences College of Nursing, Gunaraj Pathak Memorial Nursing Campus, and Kathmandu Nursing Campus) affiliated with the Council for Technical Education and Vocational Training (CTEVT) in Kathmandu Metropolitan City, Nepal. The study population included first- and second-year female PCL nursing students aged 15-19 years

Study Design

A descriptive cross-sectional study was conducted to assess the prevalence of menstrual disorders and their association with BMI among adolescent nursing students.

Sample size and sampling

The minimum required sample size was calculated using Cochran's formula based on an estimated prevalence of menstrual disorders of 33.3%,[16] a 95% confidence interval,

$n_o = Z^2 \cdot p \cdot (1 - p) / e^2 = (1.96)^2.0.333.(1-0.333)/(0.07)^2 \approx 174$

n_o= initial sample size, z = Z-value at 95% confidence interval (1.96), p = estimated prevalence of menstrual disorders (33.3%), e = margin of error (7%)

The minimum required sample size was calculated to be 174. After adjusting for a 10% non-response rate, the final required sample size was increased to 193. Although the minimum required sample size was 193, all eligible students within the selected clusters were included to enhance representativeness and statistical power. Therefore, a total of 230 students participated in the study, exceeding the minimum required sample size. A cluster sampling technique was used, where individual nursing colleges were considered as clusters. All nursing colleges offering PCL programs in Kathmandu Valley were listed as the sampling frame, and four colleges were selected using simple random sampling (lottery method), ensuring equal probability of selection. All eligible first- and second-year students from the selected colleges who provided informed consent were included in the study. Students using hormonal contraceptives were excluded.

Data Collection

Data collection was conducted from October to November 2020. Ethical approval was obtained from the Institutional Review Committee (IRC) of the Nepalese Army Institute of Health Sciences (Ref. No.: 245). In a classroom setting, the information included in the informed consent form was explained to participants, and individual written consent was obtained. The structured self-administered questionnaire was then distributed and completed in the presence of the researcher to ensure completeness. The study questionnaire was developed after reviewing relevant literature and previously published studies on menstrual health and was reviewed for content validity by experts in the relevant field. The tool was pretested among 10 students to assess clarity and comprehension, and necessary modifications were made before data

collection. BMI values were calculated as weight (kg)/height² (m²) and classified according to WHO Asian criteria: underweight (<18.5 kg/m²), normal (18.5-22.9 kg/m²), and overweight (≥23 kg/m²).[17]

Data Analysis

Data were coded and entered in Microsoft Excel and then imported into SPSS version 23 for statistical analysis. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize the data. Pearson's Chi-square test was applied to determine the association between BMI and menstrual disorders. The assumptions of the Chi-square test were checked, and where expected cell counts were less than 5, the likelihood ratio test was applied. A p-value < 0.05 was considered statistically significant. Ninety-five percent confidence intervals (95% CI) were calculated for selected key prevalence estimates to improve the precision of the reported proportions.

RESULTS

The mean age at menarche was 12.84 ± 1.25 years, with most participants attaining menarche between 12 and 14 years (78.7%, 95% CI: 73.5-83.9). The majority reported regular menstrual cycles (76.5%, 95% CI: 71.0-81.9). Oligomenorrhea was observed in 17 (7.4%) (95% CI: 4.0-10.8) of participants, indicating menstrual cycles longer than 35 days.

Overall, most participants had menstrual cycle length and bleeding duration within normal limits. However, a considerable proportion reported prolonged menstrual bleeding (31.3%, 95% CI: 25.4-37.2) and common systemic symptoms, particularly weakness or tiredness during menstruation (79.6%, 95% CI: 74.5-84.7) (Table 2). Dysmenorrhea was reported by 175 (76.1%) of participants (95% CI: 70.6-81.6). Among participants with dysmenorrhea, the majority experienced pain onset on the first day of menstruation 102 (58.3%), with most reporting a duration of 1-2 days 141 (80.6%). Pain severity was predominantly mild 138 (78.9%), while 31 (17.7%) and 6 (3.4%) reported moderate and severe pain, respectively. Common pain-relief measures included bed rest 101 (57.7%), hot application 70 (40.0%), medication 41 (23.4%), and massage 31 (17.7%) (Table 2).

A total of 230 adolescent nursing students participated in the study. The majority were aged 15-17 years 160 (69.6%), and slightly more than half were in the second year 122 (53.0%). Over half of the respondents belonged to the Brahmin/Chhetri ethnic group 123 (53.5%), while most resided in urban municipalities 207 (90.0%) (Table 1).

Table 1: Socio-demographic characteristics of respondents (n= 230).

Characteristics	Frequency n (%)
Age group (years)	
15-17	160 (69.6)
18-19	70 (30.4)
Education level	
PCL 1st year	108 (47.0)
PCL 2nd year	122 (53.0)
Ethnicity	
Dalit	6 (2.6)
Janajati	98 (42.6)
Madheshi	3 (1.3)
Brahmin/Chhetri	123 (53.5)
Residence	
Urban municipality	207 (90.0)
Rural municipality	23 (10.0)

Table 2: Menstrual characteristics and dysmenorrhea profile among respondents (n= 230).

Characteristics	Frequency n (%)	95% CI	Mean ± SD
Age at menarche (years)			
9-11	28 (12.2)	8.0-16.4	12.84 ± 1.25
12-14	181 (78.7)	73.5-83.9	
Regularity of menstruation			
15-16	21 (9.1)	5.4-12.8	
Yes	176 (76.5)	71.0-81.9	–
No	54 (23.5)	18.1-29.0	

Menstrual interval (days)			
<21	5 (2.2)	0.3-4.1	
21-28	123 (53.5)	47.1-59.9	
29-35	53 (23.0)	17.6-28.4	28.92 ± 10.37
36-45	32 (13.9)	9.4-18.4	
>45	17 (7.4)	4.0-10.8	
Duration of bleeding (days)			
3-5	158 (68.7)	62.8-74.6	5.13 ± 1.38
≥6	72 (31.3)	25.4-37.2	
Pads used per cycle			
≤12	133 (57.8)	51.3-64.3	12.55 ± 1.84
>12	97 (42.2)	35.7-48.7	
Inter-menstrual bleeding			
Yes	29 (13.5)	9.0-17.9	–
No	201 (86.5)	82.1-91.0	
Weakness/Tiredness			
Yes	183 (79.6)	74.5-84.7	–
No	47 (20.4)	15.3-25.5	
Prevalence of dysmenorrhea			
Yes	175 (76.1)	70.6-81.6	–
No	55 (23.9)	18.4-29.4	
Onset of pain (n = 175)			
One day before menstruation	36 (20.6)		
On the first day	102 (58.3)	–	–
On the second day	34 (19.4)		
Duration of pain (days, n = 175)			
During whole menstrual period	3 (1.7)		
1-2	141 (80.6)	–	1.97 ± 0.92
3-4	30 (17.1)		
Severity of pain (n = 175)			
5-6	4 (2.3)		
Mild	138 (78.9)	–	–
Moderate	31 (17.7)		
Severe	6 (3.4)		
Measures for pain relief			
Medicine	41 (23.4)		
Hot application on abdomen	70 (40.0)	–	–
Massage on back	31 (17.7)		
Bed rest	101 (57.7)		

Premenstrual symptoms were commonly reported among participants. The most frequent symptoms experienced sometimes during menstruation were anger/irritability 150 (62.2%) and difficulty sleeping 120 (52.2%). Other symptoms included abdominal bloating, headache, anxiety/tension, breast tenderness, and depressive feelings (Table 3).

Table 3: Premenstrual syndrome symptoms experienced by the respondents (n= 230).

Characteristics	Frequency n (%)		
Symptoms	Always	Sometime	Never
Difficulty sleeping	32 (13.9)	120 (52.2)	78 (33.9)
Abdominal bloating	28 (12.2)	106 (46.1)	96 (41.7)
Anger/Irritability	18 (7.8)	150 (62.2)	62 (27.0)
Breast tenderness	15 (6.5)	79 (34.3)	136 (59.1)
Headache	13 (5.7)	83 (36.0)	134 (58.3)
Anxiety/Tension	10 (4.3)	99 (43.0)	121 (52.6)
Feeling of depression	6 (2.6)	28 (12.2)	196 (85.2)

BMI was categorized as underweight, normal weight, and overweight according to the WHO Asian criteria[18] and presented as a participant characteristic (Table 4). The majority of respondents had normal BMI 155 (67.4%), followed by underweight 50 (21.7%) and overweight 25 (10.9%).

BMI was considered the independent variable, while menstrual characteristics (menstrual interval, dysmenorrhea, severity of pain, metrorrhagia, and oligomenorrhea) were treated as dependent outcome variables. The association between BMI categories and each outcome variable was assessed using Pearson's Chi-square test. No statistically significant associations were observed between BMI and menstrual interval ($p = 0.545$), dysmenorrhea ($p = 0.999$), severity of pain ($p = 0.799$), metrorrhagia ($p = 0.181$), or oligomenorrhea ($p = 0.479$) (Table 4).

Table 4: Association between Body Mass Index (BMI) categories and selected menstrual characteristics among respondents (n= 230).

Characteristics	Underweight (<18.5 kg/m²) n = 50 (21.7%)	Normal weight (18.5-22.9 kg/m²) n = 155 (67.4%)	Overweight (≥23 kg/m²) n = 25 (10.9%)	χ^2	*p*-value
Menstrual interval (days)				1.213	0.545
Normal (21-35)	41 (17.8)	117 (50.9)	18 (7.8)		
Abnormal (<21 or >35)	9 (3.9)	38 (16.5)	7 (3.0)		
Dysmenorrhea				0	0.999
Yes	38 (16.5)	118 (51.3)	19 (8.3)		
No	12 (5.2)	37 (16.1)	6 (2.6)		
Severity of pain				0.448	0.799
Mild	28 (16.0)	95 (54.3)	15 (8.6)		
Moderate-Severe	9 (5.1)	23 (13.1)	5 (2.9)		
Metrorrhagia				3.417†	0.181
Yes	9 (3.9)	19 (8.3)	1 (0.4)		
No	41 (17.8)	136 (59.1)	24 (10.4)		
Oligomenorrhea				1.471	0.479
Yes	8 (3.5)	34 (14.8)	7 (3.0)		
No	41 (17.8)	117 (50.9)	18 (7.8)		

†Likelihood ratio test applied where appropriate.

DISCUSSION

This study assessed the prevalence of menstrual disorders and their association with body mass index (BMI) among adolescent nursing students in Kathmandu. The findings demonstrate a high burden of menstrual disorders, particularly dysmenorrhea, along with a lack of statistically significant association between BMI and menstrual characteristics.

The mean age at menarche in this study was 12.84 ± 1.25 years, with the majority (78.7%) experiencing

menarche between 12 and 14 years (Table 2). This is consistent with other adolescent populations, where the mean age at menarche is typically 12-13 years, including 12.4 years reported in a Lisbon cohort.[11] The majority of participants reported regular menstrual cycles; however, a notable proportion experienced irregularity, including oligomenorrhea and prolonged bleeding. These findings support existing evidence that menstrual irregularities are relatively common during adolescence, largely due to the immaturity of the hypothalamic-pituitary-ovarian axis.[18]

In this study, 76.5% of respondents had regular menstrual intervals (21-35 days), while 23.5% reported irregular cycles, including 7.4% with oligomenorrhea. A cross-sectional study conducted in Pokhara Valley, Nepal, reported a higher prevalence of irregular cycles (64.2%), highlighting variability across populations and settings.[1] Such differences may reflect variations in study design, operational definitions, awareness levels, and sociocultural or lifestyle factors.

Dysmenorrhea was the most prevalent menstrual disorder, affecting 76.1% of respondents (Table 3). This finding is consistent with global literature reporting prevalence rates ranging from 60% to over 80% among adolescents. For instance, a study in North Borneo reported a prevalence of 85.7%.[19] Although most participants in the present study reported mild pain of short duration, the high overall prevalence underscores the substantial burden of menstrual pain and its potential impact on daily functioning and academic performance.

Menorrhagia was reported by 31.3% of participants, while irregular menstruation affected 23.5%. Intermenstrual bleeding (metrorrhagia) was observed in 13.5% of respondents (Table 2). These findings are comparable to other studies reporting variability in abnormal bleeding patterns, likely influenced by differences in population characteristics, awareness, and diagnostic criteria.[20] Premenstrual symptoms were also common, particularly anger or irritability (62.2%) and difficulty sleeping (52.2%), consistent with previous studies highlighting the high prevalence of psychological and somatic premenstrual complaints among adolescents.[21]

Regarding BMI, most participants had normal BMI (67.4%), with smaller proportions underweight (21.7%) and overweight (10.9%). Despite biological plausibility suggesting that adipose tissue may influence hormonal regulation and menstrual function, this study did not find statistically significant associations between BMI and menstrual interval, dysmenorrhea, severity of pain, metrorrhagia, or oligomenorrhea (all $p > 0.05$). Similar findings have been reported in some adolescent studies, indicating that BMI may not independently predict menstrual irregularities in this age group.[11]

The absence of a significant association between BMI and menstrual disorders may be explained by several factors. First, the relatively high proportion of participants within the normal BMI range may have limited variability, thereby reducing the statistical power to detect meaningful differences. Second, adolescence is characterized by ongoing hormonal maturation, and menstrual irregularities during this period may be more strongly influenced by endocrine immaturity than by body composition alone. Third, unmeasured confounding factors such as psychological stress, dietary habits, physical activity, and sleep patterns particularly relevant in nursing students due to academic and clinical demands may have a greater influence on menstrual health than BMI. These findings suggest that menstrual disorders in adolescents are likely multifactorial and cannot be adequately explained by BMI alone.

From a policy and practice perspective, the high prevalence of menstrual disorders observed in this study highlights the need for structured menstrual health interventions within educational institutions. Schools and nursing colleges should incorporate adolescent-friendly reproductive health services, including routine screening, counseling, and evidence-based management of menstrual symptoms. Integrating menstrual health education into nursing curricula is particularly important, as it can improve students' personal health while

also strengthening their future roles as healthcare providers in delivering accurate menstrual health information and care.

Limitations

This study has several strengths, including the use of standardized anthropometric measurements, inclusion of multiple institutions, and reporting of confidence intervals to enhance the precision of estimates. However, several limitations should be considered. The cross-sectional design precludes causal inference between BMI and menstrual disorders. Data were self-reported, which may introduce recall and reporting bias. The study population was limited to nursing students from selected institutions in Kathmandu, which may limit generalizability to other adolescent populations in Nepal. Additionally, the absence of multivariable analysis restricts the ability to control for potential confounding variables such as stress, dietary patterns, and lifestyle factors. Finally, hormonal or biochemical assessments were not conducted, which could have provided further insight into the physiological mechanisms underlying menstrual disorders.

Conclusions

Menstrual disorders, particularly dysmenorrhea, were highly prevalent among adolescent nursing students. No statistically significant association was found between body mass index and menstrual disorders. These findings highlight the need to integrate structured menstrual health education, counseling services, and adolescent-friendly reproductive health programs within school and college health systems to improve menstrual hygiene practices, early symptom management, and overall adolescent health outcomes.

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Ethics approval: Ethical approval was obtained from the Institutional Review Committee (IRC) of the Nepalese Army Institute of Health Sciences (Ref. No.: 245). Permission was obtained from the respective college authorities, and written informed consent was obtained from all participants before data collection. Participants' privacy and confidentiality were strictly maintained throughout the study

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Author contributions

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REFERENCES

1. Sharma S, Deuja S, Saha CG. Menstrual pattern among adolescent girls of Pokhara Valley: a cross sectional study. BMC women's health. 2016 Dec 9;16(1):74. [DOI]
2. Gao Y, Wang J, He M, Jiang R, Du Y, Chen Q. Menarche education and emotional preparedness: A cross-sectional survey study of Chinese adolescent girls. Heliyon. 2025 Feb 28;11(4). [DOI]
3. Varghese L, Saji A, Bose P. Menstrual irregularities and related risk factors among

adolescent girls. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2022 Aug;11(8):2159. [DOI]
4. Anthon C, Steinmann M, Vidal A, Dhakal C. Menstrual disorders in adolescence: diagnostic and therapeutic challenges. Journal of Clinical Medicine. 2024 Dec 16;13(24):7668. [DOI]
5. Takata K, Kotani K, Umino H. The relationship between body mass index and dysmenorrhea in the general female population. Journal of Clinical Medicine Research. 2023 Apr 28;15(4):239. [DOI]
6. Prasai M, Upadhyay HP, Panthi S, Khadka K, Kuwar R. Prevalence and Associated Factors of Menstruation Pattern Among Schools Adolescents. Journal of College of Medical Sciences-Nepal. 2023 May 1;19(1):101-09. [DOI]
7. Acharya S, Shrestha VL, Shrestha SB, Ghimire B, Shrestha RB. Menstrual Disorder and Associated Factors among Female of Reproductive Age Group in Sunkoshi Rural Municipality, Sindhuli: A Community-based Cross-sectional Study. One Health Journal of Nepal. 2023 Jul 28;3(5):34-8. [Link]
8. Singh M, Rajoura OP, Honnakamble RA. Menstrual patterns and problems in association with body mass index among adolescent school girls. Journal of family medicine and primary care. 2019 Sep 30;8(9):2855-8. [DOI]
9. Vincenzo De Sanctis M, Soliman A, Bernasconi S, Bianchin L, Bona G, Bozzola M, Buzi F, De C, Sanctis MD, Tonini G, Rigon10 F. Primary dysmenorrhea in adolescents: prevalence, impact and recent knowledge. Pediatric Endocrinology Reviews (PER). 2015 Dec;13(2):465-73. [Link]
10. Tayebi N, Yazdanpanahi Z, Yektatalab S, Pourahmad S, Akbarzadeh M. The relationship between body mass index (BMI) and menstrual disorders at different ages of menarche and sex hormones. Journal of the National Medical Association. 2018 Oct 1;110(5):440-7. [DOI]
11. Marques P, Madeira T, Gama A. Menstrual cycle among adolescents: girls' awareness and influence of age at menarche and overweight. Revista Paulista de Pediatria. 2022 Jan 5;40:e2020494. [DOI]
12. Thapa B, Regmi K, Shrestha N, Shrestha M. Dysmenorrhoea and its association with stress among nursing students of a selected medical college: A cross-sectional study. Journal of Kathmandu Medical College. 2023 Oct 21;12(3):143-9. [DOI]
13. Mohamed ES, Nasr EG, Abaza SE, Ahmed AM. Relationship between Body Mass Index and Menstrual pattern among Female Nursing Students. Tanta Scientific Nursing Journal. 2025 May 1;37(2). [Link]
14. Shrestha S, Manandhar S, Limbu C, Kunwar C, Sinha P, Shrestha R. Menstrual disorders and its effects on academic performance among the nursing students of PUSHS, Gothgaun. Birat Journal of Health Sciences. 2022 Dec 31;7(3):1871-6. [DOI]
15. Amgain K, Subedi P, Yadav GK, Neupane S, Khadka S, Sapkota SD. Association of Anthropometric Indices with Menstrual Abnormality among Nursing Students of Nepal: A Cross-Sectional Study. Journal of obesity. 2022;2022(1):6755436. [DOI]
16. Karki PK, Gupta R. Menstrual pattern and disorders among female students of Kathmandu medical college. Int J Contemp Med Res. 2017;4(12):1-3. [Link]
17. Tan KC. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. The lancet. 2004. [DOI]
18. Chandel S, Das S, Ojha S, Pandey M. Hormonal imbalances and genetic factors in menstrual cycle irregularities. InWomen's Health: A Comprehensive Guide to Common Health Issues in Women 2024 Aug 13 (pp. 101-128). Bentham Science Publishers. [DOI]
19. Azhary JM, Leng LK, Razali N, Sulaiman S, Wahab AV, Adlan AS, Hassan J. The prevalence of menstrual disorders and premenstrual syndrome among adolescent girls living in North Borneo, Malaysia: a questionnaire-based study.

BMC Women's Health. 2022 Aug 13;22(1):341. [DOI]
20. Poudel P. Pattern of menstruation and its problem among adolescent girls: a school based cross-sectional study. Int J Contemp Pediatr. 2022;9:635-40. [DOI]
21. Negi P, Mishra A, Lakhera P. Menstrual abnormalities and their association with lifestyle pattern in adolescent girls of Garhwal, India. Journal of family medicine and primary care. 2018 Jul 1;7(4):804-8. [DOI]

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