

Prevalence and Effects of Dysmenorrhea on Academic Performance among Secondary School Girls in Pokhara Metropolitan, Kaski

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ABSTRACT

Introduction: Dysmenorrhea is the most common gynecological problem among females, and it is defined as cramping pain in the lower abdomen occurring just before or during menstruation. The study aims to assess the prevalence of dysmenorrhea and its effects among secondary school girls in Pokhara Metropolitan, Kaski.

Methods: A cross-sectional descriptive study was conducted among 347 participants from 12 public secondary schools of Pokhara metropolitan city studying in grades 11 and 12 using semi-structured questionnaire. A standard tool, Visual Analog Scale (VAS), was used to assess the severity of pain felt by the participants. Data were entered in Epi-Data and analyzed in SPSS version 20.

Results: The prevalence of dysmenorrhea among secondary school girls was 74.4%. Of them mild, moderate, and severe dysmenorrhea accounted 20.5%, 53.5%, and 26%, respectively. Lower abdominal pain (86.8%) was the most common symptom, followed by back pain (62%). The menstrual cycle was regular among 68% of the participants. More than half (56.2%) of the participants had a positive family history of dysmenorrhea whereas, 71.3% had an occurrence of dysmenorrhea more frequently (every month). The most (84.1%) of the participants had menstrual pain on the first day; among them, 46.5% had remaining menstrual pain up to two days. Pattern of menstrual cycle, (AOR 2.860; 95% CI: 1.491-5.484), Positive family history of dysmenorrhea, (AOR 4.759; 95% CI: 2.746-8.246), intake of coffee 1-2 times per day; (AOR 0.345; 95% CI: 0.058-2.056) had statistically significant association with the prevalence of dysmenorrhea.

Conclusion: Nearly three-quarters of the secondary school girls experience dysmenorrhea. Dysmenorrhea tends to be more common among secondary school girls with a family history of dysmenorrhea and history of irregular menstruation.

Keywords: Academic performance, Dysmenorrhea, Prevalence of dysmenorrhea, Secondary school girls

INTRODUCTION

Menstruation is a naturally occurring physiological phenomenon in the life cycle of women.¹ It starts when girls become sexually mature at puberty and ceases with the end of reproductive period. It is characterized by monthly bleeding from the uterus via the vagina lasting for three to seven days.²

Dysmenorrhea is a common menstrual problem among females, and it is defined as cramping pain in the lower abdomen occurring just before or during menstruation. It is a cyclical lower abdominal or pelvic pain which may also radiate to the back and thighs, and it occurs before and/or during menstruation.³ It can be of primary and secondary type. Primary dysmenorrhea (P.D) that typically occurs in adolescence, is the painful menses with cramping sensation in the lower abdomen that occurs in the absence of any organic cause.⁴ with the pain commonly starting within three years of menarche.⁵ PD is often accompanied by other symptoms, such as sweating, headaches, nausea,

vomiting, diarrhea, and tremulousness. Even though PD is quite frequent in young women and is associated with low quality of life, it has a good prognosis.⁶

Dysmenorrhea is a common cause of absenteeism and reduced quality of life in women.⁷ The Prevalence of dysmenorrhea worldwide ranges from 15.8-89.5%, with higher prevalence rates reported in the adolescent population.⁸ Different studies in Nepal revealed different prevalence of dysmenorrhea i.e. 53.8% in Kathmandu medical college to 75.2% among adolescent girls in technical school Dang, Nepal.^{9,10}

Dysmenorrhea can cause mental problems in some females, resulting in their loneliness and reduced participation in different social activities.^{11,12} Dysmenorrhea often results in reduced classroom performance and increased

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absenteeism at school.¹³⁻¹⁵ This study aimed to assess the prevalence of dysmenorrhea and its effects among secondary school girls in Pokhara Metropolitan, Kaski.

METHODS

A cross-sectional descriptive study design was used. The study population included secondary public school girls of Grade 11 and 12 of Pokhara metropolitan city of Gandaki Province. Multistage cluster sampling technique was used to select the final clusters and purposive sampling technique was used to select the required number of respondents for the study from the selected clusters. Out of total 31 public schools, 12 schools were selected through random computer numbers. Then from each of the 12 randomly selected schools, if there were more than one stream in class 11 and 12, one stream was chosen through the lottery method. In each selected stream, if there were more than one section in 11 and 12 class, one section in each class was selected by lottery method. Girl students of the randomly selected sections of the 12 schools and meeting the inclusion criteria (currently studying in class 11 and 12, aged between 15-20 years, and who have had menstruation) were included in the study. Married girls, girls absent during the data collection day and those unwilling were excluded from the study. After the completion of the required sample size, data collection was stopped. For the sample size calculation, z = standard normal deviate for 95% Confidence interval was used as 1.96; p = proportion of dysmenorrhea among female students was taken as 0.67 percent.¹⁶ allowable error as 5% the sample size (n_0) = $(z^2pq)/d^2$ i.e. $n = (1.96 \times 1.96 \times 0.67 \times 0.33)/(0.05 \times 0.05) = 339$.¹⁷ For a finite population ($N=4339$), keeping the non-response rate of 10%, the required sample size was 347.

A structured self-administered questionnaire was developed through review of literature and consisted of questions on socio-demographic characteristics, menstruation and dysmenorrhea and academia performance. Academia performance was measured using an ordinal rating scale, consisting of four subsections such as exam performance, class performance, assignment performance and extracurricular performance. Responses to academic performance scale were measured as never, sometime, and always (ordinal scale) then categorized (recoded) into low, moderate and high effects for Spearman rank correlations. Visual Analogue Scale (VAS) was used to assess the severity of pain. Pain scale of 1-3 was classified as mild pain, 4-7 as moderate pain, and 8-10 as severe pain.¹⁸ The questionnaire was translated into Nepali language and pretested among 35 girl students of Laxmi

Adarsha Secondary School, Pokhara-26, Argaun.

Ethical approval of the research proposal was taken from Ethical Review Board of Nepal Health Research Council, and permission for data collection was taken from the Education Division of Pokhara Metropolitan office and concerned schools before the study. Written informed assent was taken from all participants under 18 years of age and written consent from all participants aged 18-20 years and from parents of respondents who were under 18 years old.

In each school, after obtaining informed written assent and/or consent, the eligible students were gathered in a classroom setting and were given instruction on how to complete the questionnaire including VAS scale and they were asked not to write their name in the questionnaire for maintaining anonymity. The respondents completed the self-administered questionnaire in the classroom setting in presence of the researcher to avoid data contamination. Data were collected during the period from 29th March to 28th October 2020.

Data entry, cleaning and analysis were done in SPSS version 20. Academia performance measured on ordinal rating scale was divided into exam performance, class performance, assignment performance, and extracurricular performance. Their responses measured in terms of never, some time, and always were coded as low, moderate, and high effects for Spearman rank correlations. Visual Analogue Scale (VAS) was used to assess the severity of pain. Pain score of 1-3 was classified as mild pain, 4-7 as moderate pain, and 8-10 as severe pain.¹⁸ The point marked on the line was measured with a ruler, and the severity of the pain felt by the respondents as indicated by facial expression was recorded. Univariate analysis was shown in frequency and percentage. The bivariate and multivariate association was done to observe the relation between dependent and independent variables.

RESULTS

Table 1: Socio-demographic Characteristics of Respondents (n= 347)

Characteristics	Number (%)
Age	
<17 Years	109 (31.40)
≥17 Years	238 (68.60)
Caste	
Dalit	73(21)
Janajati	120 (34.6)

Madhesi	10 (2.9)
Muslim	1(0.3)
Brahman/Chhetri	143(41.2)
Family income##	
<Rs. 25000	174 (50.14)
>Rs. 25000	173(49.86)
Educational status of mothers	
Illiterate	48(13.8)
Literate	119 (34.3)
Basic(1- 8 class)	102 (29.4)
Secondary(9- 12 class)	75 (21.6)
Bachelor	3(0.9)
Streams	
Science	21 (6.1)
Management	117 (33.7)
Education	176 (50.7)
Humanities	33 (9.5)
#Mean $\pm$ S.D =17.09 $\pm$ 1.156 Minimum: 15 years, Maximum: 20 years; ## Median: NPR 25000, Minimum: 5000, Maximum: 1,50,000	

Table 1 shows the mean age $\pm$ S.D. of respondents was 17.09 $\pm$ 1.156 years with age range as 15 years. The majority of respondents (68.6%) were ≥ 17 years. About two-fifth (41.2%) of them were Brahman/Chhetri. The median monthly income of the respondents' families was NPR 25000, with the monthly income range as lowest NPR 5000 to 150000. More than one-third (34.3%) of the respondents mothers were literate. About half (50.7%) of the respondents were from education stream, followed by management (33.7%), and humanities (9.5%), respectively.

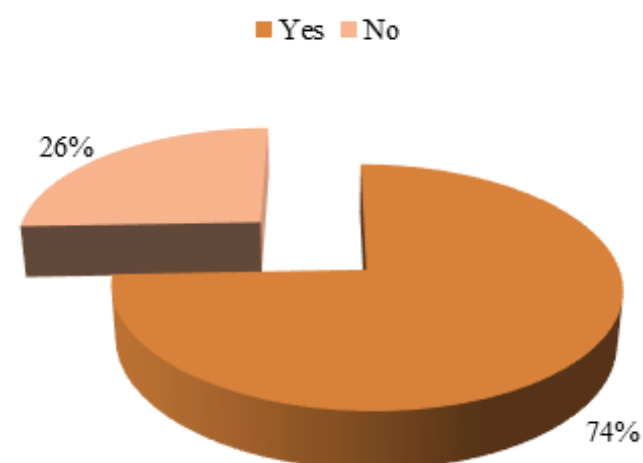


Figure 1: Prevalence of Dysmenorrhea

Table 2: Effects of Dysmenorrhea on the Respondents (n=258)

Characteristics	Never No. (%)	Sometime No. (%)	Always No. (%)
Exam performance			
Not able to study for an exam	41 (15.9)	194 (75.2)	23 (8.9)
Slow in writing exam	79 (30.6)	152 (58.9)	27 (10.5)
Lack of concentration	33(12.8)	183 (70.9)	42(16.3)
Absenteeism on exam day	201(77.9)	52(20.2)	5(1.9)
Having a warning letter	221(85.7)	32(12.4)	5 (1.9)
A low score in exam	118 (45.7)	132(51.2)	8(3.1)
Class performance			
Reduced concentration	44 (17)	178 (69)	36 (14)
Class absenteeism	98 (38)	150 (58.1)	10 (3.9)
Difficulty in remembering	51 (19.8)	183 (70.9)	24 (9.3)
Decreased participation	103 (39.9)	142 (55.04)	13(5.04)
Assignment performance			
Submitting in due date	74 (28.69)	116 (44.96)	68 (26.4)
Delay in submitting	166 (64.3)	82 (31.8)	10 (3.9)
Submitting incomplete	153 (59.3)	98 (38)	7 (2.7)
Extracurricular performance			
Lack of interest in extra classes	93 (36.04)	144 (55.82)	21 (8.14)
Inability to participate in:			
• Extracurricular activity	57 (22.1)	164 (63.6)	37 (14.3)
• Sports club activity	64 (24.8)	152 (58.9)	42 (16.3)
• Social club activity	67 (25.97)	156 (60.47)	35 (13.6)
• Daily activity regularly	55(21.3)	138(53.5)	65(25.2)

Table 2 shows the effects of dysmenorrhea among respondents. The results are categorized into various subheadings: exam performance, class performance, assignment performance, and extracurricular performance. In exam performance, three-fourths of the respondents (75.2%) were sometimes unable to study for an exam. Similarly, (58.9%) More than three fourth of the respondents (77.9%) showed an act of being present on exam day, and only one fifth (20.2%) found absenteeism sometimes. In-class performance more than two-thirds of the respondents (69%) reduced concentration. Similarly, more than half of the respondents (58.1%) were sometimes found absenteeism in class during dysmenorrhea.

In assignment performance, nearly half of the respondents (44.96%) were submitting assignments on a due date sometimes. Almost two-thirds of the respondents (64.3%) had never delayed in submitting the assignment. Similarly, more than half of the respondents (59.3%) had never

submitted an incomplete assignment. In extracurricular performance, more than half of the respondents (55.82%) sometimes lacked interest in extra classes.

Table 3: Bivariate Analysis for the Factors Associated with Dysmenorrhea

Characteristics	Dysmenorrhea		Chi-square Test value	p-value
	Yes (n=258)	No (n=89)		
	No. (%)	No. (%)		
Menstruation pattern				
Irregular	96 (86.5)	15 (13.5)	12.603	<0.001*
Regular	162 (68.6)	74 (31.4)		
Family history of dysmenorrhea				
Yes	170 (87.2)	25 (12.8)	38.413	< 0.001*
No	88 (57.9)	64 (42.1)		
Intake of coffee				
Never	116 (82.9)	24 (17.1)		
1-2 times	137 (68.5)	63 (31.5)	8.934	0.011*
≥ 3 times	5 (71.4)	2 (28.6)		

*Statistically significant at 95% level of confidence, p-value <0.05

Table 3 shows a significant association between the menstruation pattern, family history of dysmenorrhea, and intake of coffee with dysmenorrhea at the 5% level of significance using the chi-square test.

Table 4: Multivariate analysis for the factors associated with dysmenorrhea

Characteristics	AOR (95% CI)	p-value
Age		
< 17 years	0.603 (0.347-1.048)	0.073
≥17 years	Ref.	

Menstruation pattern

Irregular	2.860 (1.491-5.484)	0.002*
Regular	Ref.	

Family history of dysmenorrhea

Yes	4.759 (2.746-8.246)	<0.001*
No	Ref.	

Drink coffee

1-2 times	0.434 (0.244-0.774)	0.005*
≥3 times	0.345 (0.058-2.056)	0.242
Never	Ref.	

*Statistically significant at 95% level of confidence, p-value <0.05

Table 4 shows the unadjusted and adjusted odds ratio with 95% confidence interval for factors associated with dysmenorrhea. Results from regression analysis showed that variables with a p-value < 0.05, i.e., the menstrual cycle pattern, family history of dysmenorrhea, and drinking coffee, were significantly associated with dysmenorrhea.

Secondary school girls with the irregular menstruation cycle were 2.860 times more likely to have dysmenorrhea compared to regular menstruation (AOR 2.860, 95% CI, 1.491-5.484).

Similarly, those with a family history of dysmenorrhea were 4.759 times more likely to have dysmenorrhea than those who did not have a family history of dysmenorrhea (AOR 4.759, 95% CI, 2.746-8.246).

Similarly, in the case of lifestyle and behavior-related factors, those who drink coffee 1-2 times per day were 43.4% participants to have dysmenorrhea compared to those who have never intake of coffee. (AOR 0.434, 95% CI, 0.244-0.774).

Table 5: Correlation between Severity of Dysmenorrhea and Academia Performance Related Characteristics (n=258)

Characteristics	Activities	Severity of dysmenorrhea			Spearman	P- value
		Mild No. (%)	Moderate No. (%)	Severe No. (%)		
Exam performance						
Not able to study for an exam	Never	13(5.0)	23(8.9)	5(1.9)	0.264	<0.001*
	Sometime	39(15.1)	108(41.9)	47(18.2)		
	Always	1(0.4)	7(2.7)	15(5.8)		
Slow in writing exam	Never	20(7.8)	45(17.4)	14(5.4)	0.220	<0.001*
	Sometime	32(60.4)	84(60.9)	36(53.7)		
	Always	1(0.4)	9(3.5)	17(6.6)		

Lack of concentration	Never	10(3.9)	18(7)	5(1.9)	0.241	<0.001*
	Sometime	40(15.5)	102(39.5)	41(15.9)		
	Always	3(1.2)	18(7.0)	21(8.1)		
Absenteeism on exam day	Never	45(17.4)	109(42.2)	47(18.2)	0.132	0.035*
	Sometime	8(3.1)	28(10.9)	16(6.2)		
	Always	-	1(0.4)	4(1.6)		
Having a warning letter	Never	46(17.8)	120(46.5)	55(21.3)	0.057	0.359
	Sometime	7(2.7)	17(6.6)	8(3.1)		
	Always	-	1(0.4)	4 (1.6)		
A low score in exam	Never	31(12.0)	65 (25.2)	22 (8.5)	0.203	<0.001*
	Sometime	22 (8.5)	71(27.5)	39 (15.1)		
	Always	-	2 (0.8)	6 (2.3)		
Class performance						
Reduced concentration	Never	6 (2.3)	28 (10.9)	10 (3.9)	- 0.013	0.838
	Sometime	37 (14.3)	96 (37.2)	45 (17.4)		
	Always	10 (3.9)	14 (5.4)	12 (4.7)		
Class absenteeism	Never	26 (10.1)	56 (21.7)	16 (6.2)	0.215	<0.001*
	Sometime	27 (10.5)	79 (30.6)	44 (17.1)		
	Always	-	3 (1.2)	7 (2.7)		
Difficulty in remembering	Never	13(5.0)	29(11.2)	9 (3.5)	0.184	0.003*
	Sometime	38(14.7)	101 (39.1)	44 (17.1)		
	Always	2 (0.8)	8 (3.1)	14 (5.4)		
Decreased participation	Never	25 (9.7)	58 (22.5)	20 (7.8)	0.164	0.008*
	Sometime	27(10.5)	77 (29.8)	38 (14.7)		
	Always	1 (0.4)	3 (1.2)	9 (3.5)		
Assignment performance						
Submitting in due date	Never	11 (4.3)	48 (18.6)	15 (5.8)	0.074	0.236
	Sometime	30 (11.6)	59 (22.9)	27 (10.5)		
	Always	12(4.7)	31 (12.0)	25 (9.7)		
Delay in submitting	Never	39 (15.1)	90 (34.9)	37 (14.3)	0.148	0.017*
	Sometime	14 (5.4)	44 (17.1)	24 (9.3)		
	Always	-	4 (1.6)	6 (2.3)		
Submitting incomplete	Never	33 (12.8)	79 (30.6)	41 (15.9)	0.001	0.988
	Sometime	17 (6.6)	58 (22.5)	23 (8.9)		
	Always	3 (1.2)	1 (0.4)	3 (1.2)		
Extracurricular performance						
Lack of interest in extra classes	Never	18(6.98)	48 (18.60)	27(10.47)	-0.014	0.825
	Sometime	33(12.79)	78 (30.23)	33(12.79)		
	Always	2 (0.78)	12 (4.65)	7 (2.71)		
Not able to participate in extra curricular activity	Never	9 (3.49)	33 (12.79)	15 (5.81)	0.026	0.682
	Sometime	40(15.50)	84 (32.56)	40(15.50)		

Participate in sports club activity	Always	4 (1.55)	21 (8.15)	12 (4.65)	0.027	0.663
	Never	7 (2.71)	44 (17.05)	13 (5.04)		
	Sometime	41(15.89)	70 (27.13)	41(15.89)		
Participate in Social club activity	Always	5 (1.95)	24 (9.30)	13 (5.04)	0.047	0.452
	Never	15 (5.8)	33 (12.8)	19 (7.4)		
	Sometime	33 (12.8)	88 (34.1)	35 (13.6)		
Ability to conduct daily activity regularly	Always	5 (1.9)	17 (6.6)	13 (5.0)	0.089	0.152
	Never	12 (4.65)	31 (12.02)	12 (4.65)		
	Sometime	30(11.63)	75 (29.07)	33(12.8)		
	Always	11 (4.26)	32 (12.40)	22 (8.53)		

Table 5 shows that there was a low degree of positive correlation effect between the severity of dysmenorrhea with academic performance (exam performance, class performance, assignment performance, and extracurricular performance) except getting a warning letter due to absenteeism in the exam ($r=0.057$), reduced concentration in the classroom ($r=-0.013$), submitting the assignment in due date ($r=0.074$) and submitting the assignment by incomplete ($r=0.001$), not able to participate in an extracurricular activity ($r=0.026$), participate in sports club activity ($r=0.027$), participate in social club activity ($r=0.047$) ability to conduct daily activity regularly($r=0.089$) respectively.

DISCUSSION

The prevalence of dysmenorrhea in this study was found to be 74.4% among secondary school girls in Pokhara metropolitan, which was similar with 74.4% in a descriptive study conducted in four secondary schools girls in Arar city of Northern Saudi Arabia on 344 secondary school students during the academic year 2015-2016.¹⁹ Similarly, 67% prevalence was reported in Kathmandu University School of Medical Sciences conducted among 16-24 years students¹⁶ and 65.02% among Japanese female junior high school girls of Kadapa district, Japan.²⁰ This inconsistency may be due to the difference in included key symptoms (major and minor) of dysmenorrhea in different studies. Moreover, the results of these studies also vary according to the culture of countries, patterns of lifestyle, and genetic factors.

Family history of dysmenorrhea in this study was found significantly associated with dysmenorrhea (AOR 4.759, 95% CI, 2.746-8.246). Dysmenorrhea was 4.759 times higher among those who had a

family history of dysmenorrhea. This was in line with the findings of a similar study conducted among the adolescent population of Tbilisi, Georgia; the risk of dysmenorrhea in students who had a family history of dysmenorrhea was approximately six times higher than in students with no prior history.²¹ This was comparatively lower in a similar study conducted in Dumlupinar University, western Turkey, in aged between 20.8 ± 1.8 years, dysmenorrhea was 3.043 times higher among those who had a family history of dysmenorrhea.²² This inconsistency maybe because of the socio-cultural differences of the study groups in age and lifestyle.

However, no significant difference was observed between dysmenorrhea and the age of participants (AOR 0.603, 95% CI, 0.347 -1.048), which was consistent with the cross-sectional study conducted in seven schools of Pokhara Valley.²³ but a systematic review on dysmenorrhea's prevalence and risk factors confirmed that dysmenorrhea is inversely related to age.²⁴ This inconsistency might be because in our study age group was 15-20 years and a one-time study, less effective results than a systematic review and prospective study.

Menstruation pattern in this study was found significantly associated with dysmenorrhea (AOR 2.860; 95% CI, 1.491-5.484) which is inconsistent with the study conducted among adolescent students in seven schools of Pokhara Valley, Nepal.²⁵ In contrast, dysmenorrhea was 0.59 times less likely to have dysmenorrhea within age between 16-21 years of public high school students in Kuwait.²⁶ This is comparatively lower in a similar study conducted

among Chinese female university students aged between 19 ± 1.2 years, whereas the irregular menstruation pattern was 1.216 times more likely to have dysmenorrhea compared to irregular menstruation.²⁷

The study revealed that dysmenorrhea is associated with intake of coffee (AOR 0.434; 95% CI, 0.244-0.774), which was similar to the study conducted in Spanish university students aged 20.63 ± 3.32 years (AOR 2.19; 95% CI 1.19-4.04).²⁸

Considering the severity of dysmenorrhea, the result in the present study showed that the majority of secondary school girls suffered from moderate dysmenorrhea. This result is inconsistent with other studies conducted age between 18-21 years Nursing College students in central and south Gujarat, India; it was found that 42 % of participants had severe pain.²⁹

Our study revealed that the severity of dysmenorrhea had a low degree of positive correlation with academic performance, including exam performance, class performance, and assignment performance among secondary school girls. This is inconsistent with the study conducted in the stream of nursing at KAU in Jeddah, Saudi Arabia showed a low degree of adverse correlation effects between academic performance and severity of dysmenorrhea.³⁰

CONCLUSION

The prevalence of dysmenorrhea among secondary school girls in Pokhara Metropolitan, Kaski, is high. Dysmenorrhea tends to be more common among secondary school girls with a family history of dysmenorrhea and irregular menstruation pattern. Similarly, the severity of dysmenorrhea tends to influence the academic performance, including exam performance, class performance, and assignment performance among secondary school girls. Therefore, to address the issue of dysmenorrhea, health education related to dysmenorrhea should be incorporated into the school health program at the local level.

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