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Prevalence of Dysmenorrhea and Associated Factors among Secondary School Female Students in Rapti Rural Municipality, Dang, Nepal

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Abstract: Dysmenorrhea is one of the most common menstrual problems among adolescent females. It is defined as painful cramps or pain of uterine origin that happens during or before menstruation. It has a severe impact on day-to-day activities, including school absenteeism and reduced social and physical activity. Hence, this study aimed to assess the prevalence of dysmenorrhea and its associated factors among secondary school female students in Rapti Rural Municipality, Dang, Nepal. A cross-sectional study was conducted from April 2024 to September 2024 among female secondary school students in government schools in Rapti Rural Municipality, Dang, Nepal. Students were selected through a proportionate stratified random sampling technique. A self-administered questionnaire was used to collect data from 316 adolescent girls; however, only 312 were included in the study. Data were checked, coded, and entered into EpiData (version 3.1), and analysed in SPSS version 26 using both descriptive and inferential statistics. The prevalence of dysmenorrhea was found to be 86.2%; among them, half of the respondents experienced severe pain (43.5%), followed by mild (41.6%) and moderate (14.9%). Ethnicity ($\chi2$=12.69, p=0.026), family history of dysmenorrhea ($\chi2$=20.358, p=0.001), menstrual cycle length ($\chi2$=6.729, p=0.035) and experience of spotting in between periods ($\chi2$=8.406, p=0.015) had statistically significant associations with dysmenorrhea. Severity of dysmenorrhea was found to be significantly associated with school absenteeism ($\chi2$=33.428, p=0.001), source of information regarding menstruation ($\chi2$=21.463, p=0.006), coping strategies like taking bed rest ($\chi2$=18.736, p=0.001), self-medication ($\chi2$=10.067, p=0.007), applying massage ($\chi2$=8.86, p=0.012) and being hospitalised due to pain ($\chi2$=7.135, p=0.028). Dysmenorrhea is a serious public health concern among adolescent girls in Rapti Rural Municipality. Factors such as family history, ethnicity, and irregular menstrual cycles significantly contribute to this burden that leads to notable school absenteeism and reliance on inadequate coping methods like self-medication. Dysmenorrhea places a substantial social and educational burden on affected students and their families, highlighting the need for better awareness and improved practical support in schools.

Keywords: *Dysmenorrhea, Associated factors, Secondary level female students, School absenteeism*

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1. Introduction

Dysmenorrhea is one of the most common menstrual problems among adolescent females. It is defined as painful cramps or pain of uterine origin that happens during or before menstruation. The pain is usually located in the lower abdomen and sometimes in the back and thighs. Alongside the cramps, it is also associated with other symptoms such as lethargy, dizziness, nausea, diarrhoea, mood swings and headaches (Iacovides, Avidon, & Baker, 2015). It has a severe impact on day-to-day activities, such as school absenteeism and decreased participation in social and physical activities (Karmacharya, Bhattarai, Tiwari, & Singh, 2022).

The World Health Organisation (WHO) defines adolescence as the stage between childhood and adulthood, spanning the ages of 10 to 19 years. It is a critical period of life that is linked to development. Furthermore, this concept is a unique stage of human development and also an important time for laying the foundations of good health (WHO, 2006). One of

the key body changes during puberty in females is the start of menstruation. Menstruation is a normal physiological process that typically begins at puberty. Nevertheless, this is frequently linked to abnormal menstruation, heavy periods and dysmenorrhea (Agarwal & Agarwal, 2010). Dysmenorrhea is classified into two types: primary and secondary. Primary dysmenorrhea, which is common in adolescents, is derived from normal ovulatory cycles and no pelvic pathology, while secondary dysmenorrhea originates from identifiable pathological conditions (Núñez-Troconis, Carvallo, & Martínez-Núñez, 2021).

Although primary dysmenorrhea does not pose a life-threatening case, it nevertheless burdens the quality of life of women or female adolescents. This condition may impact relationships, academic performance, work productivity, and social and recreational activities (Iacovides et al., 2015). According to Slap (2003), the leading cause of recurrent short-term school absence in adolescent girls is. The prevalence of dysmenorrhea varies by geographic location. Studies conducted in France showed a prevalence of 92.9% (Hadjou et al., 2022), 85.7% in Malaysia (Azhary et al., 2022), 78% in Morocco (Lghoul, Loukid, & Hilali, 2020), 87.6% in Nepal (Prasai, Upadhyay, Panthi, Khadka, & Kuwar, 2023), and 85.6% in Kuwait (Al-Matouq et al, 2019).

Studies in Nepal have shown that many adolescents have dysmenorrhea. Research conducted in Chitwan found a prevalence of 87.5% (Sigdel, Joshi, Thapa, Koirala, & Sharma, 2023), while a study in the Pokhara Valley revealed that 71.5% of adolescent girls experienced dysmenorrhea (Sharma, Deuja, & Saha, 2016). Research conducted in 2019 on adolescent girls studying in technical schools of Dang district, out of the Mid-Western region of Nepal, reported a 75.2% prevalence (Baidhya & Prasad Paneru, 2020). Most studies in the Midwestern region focus on menstrual hygiene and sanitation. However, menstrual problems like dysmenorrhea have been less studied.

Adolescents and their parents often struggle to determine what a normal menstrual cycle should be. In addition, most girls feel too embarrassed to discuss their problems with menstruation. As a result, they do not report or receive treatment for it (Diaz, Laufer, & Breech, 2006). Understanding the health problems related to menstruation, dysmenorrhea, and the healthcare-seeking behaviour of adolescent girls will help in designing programs for this group (Singh, Devi, & Gupta, 1999). A study has been conducted in Dang district; however, no recent study has been conducted on Rapti Rural Municipality. Consequently, the researcher aims to determine the prevalence of dysmenorrhea and its associated factors among secondary school female students in Rapti Rural Municipality, Dang, Nepal.

2. Materials and methods

Study Design and Setting

A descriptive cross-sectional study was conducted from April to September 2024 among secondary-level female students attending government schools in Rapti Rural Municipality, Dang District, Lumbini Province, Nepal. The study area was selected because adolescents in rural parts of the country are often less familiar with menstruation-related problems, and no prior studies on this topic had been conducted in this municipality. There were eight government secondary schools in the municipality, all of which were included in the study.

Study Population and Sampling

The study population consisted of female students in grades 9 and 10 from the eight government secondary schools. The total population (sampling frame) was 858 students.

Sample size was calculated using the Cochran's formula (Daniel and Cross, 2012)

n= (z^2 pq)/d^2

where, n = the desired sample size

z= the standard normal deviate (set for a 95% Confidence Interval) = 1.96

Absolute allowable error (d) = 5% = 0.05

P = prevalence of the problem = 75.2% (According to the study done on the topic “Prevalence of dysmenorrhea and its associated factors among adolescent girls studying in Technical schools of Dang, Nepal”) (Baidhya & Paneru, 2020)

The initial sample size was 287, and after adding a 10% non-response rate, the final sample size was 316.

A proportionate stratified random sampling technique was used. The schools served as the strata. The sample was allocated proportionally to each school based on its population size. The required number of students from each grade within each school were then selected using a lottery method, a simple random sampling technique, from the list of female students obtained from school registers.

Data Collection Technique and Tool

Data were collected using a self-administered, semi-structured questionnaire. The tool was developed following an extensive review of the literature (Baidhya & Paneru, 2020; Jha & Gautam, 2024), and it consisted of four parts: socio-demographic characteristics, menstruation patterns and practices, dysmenorrhea and other menstruation-related symptoms, and coping strategies. The intensity of menstrual pain was measured using the Numeric Pain Rating Scale (NPRS), where 0 indicates no pain and 10 indicates the worst possible pain. The questionnaire was initially prepared in English, translated into Nepali, and then back-translated to ensure accuracy.

Validity and Reliability
The validity of the instrument was established through an extensive literature review and consultation with the research supervisor, subject teachers, and experts in the field. Content validity was ensured by their feedback. The reliability of the tool was confirmed by using a questionnaire adapted from previously published and pre-tested research articles (Jha & Gautam, 2024). A pre-test was conducted on 10% of the sample size (32 students) at a school outside the study area (Shree Pashupati Vidya Ashram Secondary School, Narayanpur, Dang) to assess clarity and consistency. Based on the pre-test, minor modifications were made to the wording of certain questions to enhance understanding.

Data Collection Procedure
Ethical approval was obtained from the Institutional Review Committee (IRC) of Nobel College. Official permission was secured from the Rapti Rural Municipality office and the principals of the selected schools. Written informed consent was obtained from the school principals, who acted as guardians, and assent was obtained from each participating student. The researchers explained the study's purpose and procedures to the students. Data were collected during school hours in a comfortable environment with only female students and a female teacher present. Anthropometric measurements (height and weight) were taken using a stature meter and a weighing machine to calculate Body Mass Index (BMI).

Data Processing and Analysis
The collected data were checked for completeness and accuracy on a daily basis. Data were coded, entered into Epi Data version 3.1, and then exported to SPSS version 26 for analysis. Descriptive statistics (frequency, percentage, mean, standard deviation) were used to describe the study variables. The association between dysmenorrhea and independent variables was analyzed using the Pearson Chi-square test. A p-value of less than 0.05 was considered statistically significant.

Ethical Consideration
The ethical clearance from the IRC of Nobel College was obtained for the study. There was voluntary involvement, and consent in writing was acquired. Confidentiality and anonymity of respondents were ensured at all stages of the research process. Data was used only for research purposes. Furthermore, no names were mentioned in the questionnaire. Participants could choose to leave from the study whenever they wished.

3. Results

Out of 316 adolescent female students recruited for the study, 4 students were excluded due to incompletely filled questionnaires, resulting in a total of 312 students and a response rate of 98.7%.

3.1. Socio-demographic and Menstrual Characteristics

The socio-demographic profile of the 312 participants is summarised in Table 1. The mean age of the respondents was 15.05 years (±0.992 SD), with ages ranging from a minimum of 13 years to a maximum of 18 years. A majority of the students (68%, n = 212) were aged 15 years or younger, while the remaining 32% (n = 100) were older than 15 years. In terms of educational level, 59.3% (n = 185) were in grade 10, and 40.7% (n = 127) were in grade 9.
The ethnic distribution revealed that more than half of the participants (52.6%, n = 164) identified as Janajati/Aadibaasi. This was followed by Chhetri (22.8%, n = 71), Dalit (12.2%, n = 38), Brahman (9.0%, n = 28), Madhesi (1.9%, n = 6), and Muslim (1.6%, n = 5). The religious composition was predominantly Hindu (92.3%, n = 288), with smaller representations of Christianity (4.2%, n = 13), Buddhism (1.9%, n = 6), and Islam (1.6%, n = 5). Most respondents (73.1%, n = 228) came from nuclear families, while 23.1% (n = 72) were from joint families, and a small proportion (3.8%, n = 12) came from extended families.
Regarding parental occupations, the most common occupation for fathers was foreign employment (30.7%, n=93), followed by agriculture (26.7%, n=81), labour (22.1%, n=67), business (9.6%, n=29), service (7.3%, n=22), and unemployment (3.6%, n=11). For mothers, the majority were homemakers (45.2%, n=140), with others engaged in agriculture (27.1%, n=84), service (7.4%, n=23), business (7.1%, n=22), labour (6.5%, n=20), foreign employment (3.9%, n=12), and unemployment (2.9%, n=9). A significant majority of the adolescents (70.2%, n = 219) reported not knowing their family's monthly income. Among those who did, 17.9% (n=56) reported an income of NRs 25,000 and above, 6.7% (n=21) reported NRs 15,000-25,000, 4.2% (n=13) reported NRs 5,000-15,000, and 1% (n=3) reported an income of less than NRs 5,000.
The educational attainment of the mothers of the participants was varied. Nearly half (47.4%, n=147) were literate (could read and write), 26.8% (n=83) had primary level education, 14.5% (n=45) had basic level education, 5.2% (n=16) were illiterate, 4.2% (n=13) had secondary level education, and 1.9% (n=6) had a bachelor's degree or higher. Anthropometric measurements revealed a mean BMI of 19.95 kg/m² (±2.59 SD) among the participants. Based on the WHO

classifications for adolescents, most students (72.1%, n = 225) had a normal weight, while 19.6% (n = 61) were underweight, 6.1% (n = 19) were overweight, and 2.2% (n = 7) were obese.

Table 1: Socio-demographic Characteristics of the Respondents (n = 312)

Variables	Frequency	Percentage (%)
Mean age (SD)	15.05±0.992 years, Maximum:18 years, Minimum:13 years	
Age (in completed years)		
≤15 years	212	68
>15 years	100	32
Level Of Education		
Grade 9	127	40.7
Grade 10	185	59.3
Ethnicity		
Brahman	28	9
Chhetri	71	22.8
Janajati/Aadibaasi	164	52.6
Dalit	38	12.2
Madhesi	6	1.9
Muslim	5	1.6
Religion		
Hinduism	288	92.3
Buddhism	6	1.9
Christianity	13	4.2
Islam	5	1.6
Type Of Family		
Nuclear	228	73.1
Joint	72	23.1
Extended	12	3.8
Occupation Of Father		
Agriculture	81	26.7
Service (Government/Private)	22	7.3
Foreign Employment	93	30.7
Business	29	9.6
Labor	67	22.1
Unemployed	11	3.6
Occupation Of Mother		
Agriculture	84	27.1
Service (Government/Private)	23	7.4
Foreign Employment	12	3.9
Business	22	7.1
Labor	20	6.5
Homemaker	140	45.2
Unemployed	9	2.9
Monthly Income of the Family		
Less than 5000	3	1
5000-15000	13	4.2
15000-25000	21	6.7
25000 and above	56	17.9
Don't Know	219	70.2
Mother's Educational Level		

Illiterate	16	5.2
Can read and write	147	47.4
Primary level education	83	26.8
Basic level education	45	14.5
Secondary level	13	4.2
Bachelors level and above	6	1.9
BMI Category		
Underweight	61	19.6
Normal weight	225	72.1
Overweight	19	6.1
Obese	7	2.2
Mean BMI (SD)	19.95±2.59	

3.2. Menstruation Pattern and Practices

The characteristics related to menstruation patterns and practices are detailed in Table 2. The mean age at menarche was 12.18 years (±0.871 SD), with a range from 10 to 15 years. The majority of girls (81.1%, n=253) experienced their first menstruation at a median age (12-14 years), while 17.3% (n=54) had an early menarche (<12 years), and only 1.6% (n=5) had a delayed menarche (15 years or above). The primary source of information regarding menstruation for most adolescents was their mother or sister (75.6%, n = 236). Other sources included teachers (11.5%, n = 36), friends (10.9%, n = 34), mass media (1.3%, n = 4), and fathers (0.6%, n = 2).

A concerning 63.5% of respondents had an irregular menstrual cycle. Specifically, 31.1% (n=97) had a cycle length of less than 21 days, and 32.4% (n=101) had a cycle length greater than 35 days. Only 36.5% (n = 114) had a regular cycle length of 21-35 days. The duration of menstrual bleeding was regular (3-7 days) for most participants (78.5%, n = 245). A shorter duration (<3 days) was reported by 12.5% (n = 39), and a longer duration (>7 days) by 9% (n = 28). The usual amount of menstrual flow was perceived as normal by 77.9% (n = 243) of the girls, while 14.7% (n = 46) reported scant flow, and 7.4% (n = 23) reported excessive flow. The vast majority (91.3%, n = 285) never experienced spotting between periods, while 8% (n = 25) sometimes did, and 0.6% (n = 2) usually experienced it.

Regarding menstrual hygiene practices, sanitary pads were the most commonly used material (74.4%, n = 232), followed by a combination of pads and cloth (23.7%, n = 74). Only a small minority used only cloth (1.9%, n=6). Among those who used cloth (n = 80), a large majority (87.5%, n = 70) reused it after washing. The number of soaked pads or cloths used per day was 3 to 7 for most girls (77.2%, n=241), while 14.4% (n=45) used 2 or fewer, and 8.3% (n=26) used 8 or more.

Table 2: Menstruation Patterns and Practices of the Respondents (n=312)

Variable	Category	Frequency (n)	Percentage (%)
Age at Menarche (years)	12-14 (Medium)	253	81.1
	<12 (Early)	54	17.3
	≥15 (Delayed)	5	1.6
Mean Age at Menarche (SD)	12.18 (±0.871)		
Source of Information	Mother/Sister	236	75.6
	Teacher	36	11.5
	Friends	34	10.9
	Mass Media	4	1.3
	Father	2	0.6
Menstrual Cycle Length	<21 days	97	31.1
	>35 days	101	32.4
	21-35 days (Regular)	114	36.5
Duration of Bleeding	3-7 days (Regular)	245	78.5
	<3 days (Short)	39	12.5
	>7 days (Long)	28	9.0

Amount of Flow	Normal	243	77.9
	Scanty	46	14.7
	Excessive	23	7.4
Experienced Spotting	Never	285	91.3
	Sometimes	25	8.0
	Usually	2	0.6
Materials Used	Sanitary Pad	232	74.4
	Both Pad and Cloth	74	23.7
	Cloth only	6	1.9

3.3. Prevalence and Characteristics of Dysmenorrhea

The prevalence and characteristics of dysmenorrhea are presented in Table 3. The study found a high prevalence of dysmenorrhea, with 86.2% (n=269) of the participants reporting experiencing painful cramps during menstruation. Among those with dysmenorrhea, the severity of pain was a critical finding. Nearly half (43.5%, n=117) experienced severe pain (NPRS score 7-10), while 41.6% (n=112) experienced mild pain (NPRS 1-3), and 14.9% (n=40) experienced moderate pain (NPRS 4-6). More than half (54.6%, n = 147) experienced this pain irregularly over the last six months, while 45.4% (n = 122) experienced it every month.

The most frequently reported site of pain was the lower abdomen and back (43.9%, n=118), followed by the lower abdomen alone (41.6%, n=112). Pain extending to other parts of the body was reported by 8.2% (n = 22), and only back pain by 6.3% (n = 17). For the majority (85.5%, n = 230), the pain lasted 1 to 3 days, and for 14.5% (n = 39), it lasted more than 3 days. The onset of pain was typically before the menstrual flow began (85.5%, n = 230), with only 14.5% (n = 39) reporting pain starting on the day of menstruation.

The impact of dysmenorrhea was significant. Over a third (37.5%, n=101) of the affected students reported missing school at least once due to menstrual pain. A small percentage (1.5%, n = 4) had even missed an examination due to the pain. A positive family history of dysmenorrhea was common, reported by 59.3% (n=185) of all participants. Besides pain, adolescents experienced a range of other menstruation-related symptoms. The most prevalent symptoms were a feeling of tiredness or lethargy (62.2%, n = 194), followed by changes in appetite (49.0%, n = 153), dizziness (21.5%, n = 67), headache (20.2%, n = 63), and acne (15.4%, n = 48). Other symptoms like abdominal bloating, nausea, diarrhoea, indigestion, breast tenderness, irritability, and mood swings were reported less frequently. Only 10.6% (n = 33) reported none of these additional symptoms.

Table 3: Prevalence and Characteristics of Dysmenorrhea (n=312)

Variable	Category	Frequency (n)	Percentage (%)
Experience of Dysmenorrhea	Yes	269	86.2
	No	43	13.8
Severity of Pain (n=269)	Severe	117	43.5
	Mild	112	41.6
	Moderate	40	14.9
Frequency of Pain (n=269)	Irregularly	147	54.6
	Regularly	122	45.4
Site of Pain (n=269)	Both Lower Abdomen & Back	118	43.9
	Lower Abdomen only	112	41.6
	Extends to other parts	22	8.2
	Back only	17	6.3
Duration of Pain (n=269)	1-3 days	230	85.5
	>3 days	39	14.5
Onset of Pain (n=269)	Prior to flow	230	85.5
	On day of menstruation	39	14.5
School Absenteeism (n=269)	Yes	101	37.5
	No	168	62.5
Missed Exam (n=269)	Yes	4	1.5
	No	265	98.5

Family History of Dysmenorrhea (n=312)	Yes	185	59.3
	No	127	40.7
Associated Symptoms (n=312, Multiple Response)	Feeling of Tiredness	194	62.2
	Changes in Appetite	153	49.0
	Dizziness	67	21.5
	Headache	63	20.2
	Acne	48	15.4
	Abdominal Bloating	30	9.6
	Irritability	30	9.6
	Diarrhea	21	6.7
	Breast Pain	22	7.1
	Indigestion	16	5.1
	Mood Swings	18	5.8
	Nausea/Vomiting	14	4.5
	None	33	10.6

3.4. Coping Strategies for Dysmenorrhea

Table 4 outlines the coping strategies employed by the 269 adolescents who experienced dysmenorrhea. The most common non-pharmacological method was bed rest, practised by 70.3% (n=189) of the girls. Other strategies included applying massage to the affected area (21.2%, n = 57) and using a heating pad (12.6%, n = 34). Pharmacological interventions were less common; self-medication (using painkillers without a prescription) was reported by 10.4% (n = 28), while only 1.9% (n = 5) used medication prescribed by a doctor. The use of herbs was minimal (0.7%, n = 2). A notable proportion (23.8%, n = 64) reported doing nothing to manage their pain. The severity of the condition was underscored by the fact that 3% (n=8) of the respondents with dysmenorrhea had been hospitalised at least once due to the pain.

Table 4: Coping Strategies Used by Adolescents for Dysmenorrhea (n=269; Multiple Response)

Coping Strategy	Frequency (n)	Percentage (%)
Bed Rest	189	70.3
None	64	23.8
Apply Massage	57	21.2
Use of Heating Pad	34	12.6
Self-medication	28	10.4
Medication prescribed by doctor	5	1.9
Use of Herbs	2	0.7
Hospitalized due to pain		
Yes	8	3
No	261	97

3.5. Factors Associated with Dysmenorrhea

The analysis of factors associated with the presence and severity of dysmenorrhea yielded several significant relationships, as shown in Table 5.

The prevalence of dysmenorrhea showed a statistically significant association with ethnicity (χ^2=12.69, p=0.026). All Brahman and Muslim respondents reported dysmenorrhea, while the prevalence was lower among Janajati/Aadibaasi (80.7%). A highly significant association was found with a family history of dysmenorrhea (χ^2=20.358, p=0.001). The prevalence was 93.5% among those with a family history, compared to 75.6% among those without. No significant associations were found between dysmenorrhea and age, academic grade, religion, type of family, mother's education, monthly income, or BMI (p>0.05 for all).

Dysmenorrhea was significantly associated with menstrual cycle length (χ^2 = 6.729, p = 0.035). The prevalence was highest (91.8%) in those with a cycle length of less than 21 days. A significant association was also found with the experience of spotting between periods (χ^2 = 8.406, p = 0.015), as all respondents who reported spotting (sometimes or

usually) reported experiencing dysmenorrhea. No significant associations were found with age at menarche, duration of bleeding, amount of flow, or materials used during menstruation.

The severity of dysmenorrhea was significantly associated with several factors. School absenteeism showed a strong association ($\chi^2 = 33.428$, $p < 0.001$). Among those who missed school, 53.5% had severe pain, compared to 37.5% of those who did not miss school. The source of information about menstruation was also significant ($\chi^2=21.463$, $p=0.006$). For instance, a higher proportion of those who heard from teachers (61.3%) had mild pain compared to those who heard from their mother/sister (37.5%). Several coping strategies were linked to pain severity. Those who practised bed rest ($\chi^2=18.736$, $p=0.001$), self-medication ($\chi^2=10.067$, $p=0.007$), applied massage ($\chi^2=8.86$, $p=0.012$), or had been hospitalised ($\chi^2=7.135$, $p=0.028$) were more likely to report severe pain. The severity of dysmenorrhea was not associated with the other socio-demographic or menstrual pattern variables analysed.

Table 5: Factors Significantly Associated with Dysmenorrhea and its Severity

Variable	Category	Analysis	χ^2 Value	P-value
Associated with Presence of Dysmenorrhea				
Ethnicity	Brahman, Chhetri, Janajati, etc.	Dysmenorrhea (Yes/No)	12.691	0.026*
Family History of Dysmenorrhea	Yes vs. No	Dysmenorrhea (Yes/No)	20.358	0.001*
Menstrual Cycle Length	<21, 21-35, >35 days	Dysmenorrhea (Yes/No)	6.729	0.035*
Experienced Spotting	Never, Sometimes, Usually	Dysmenorrhea (Yes/No)	8.406	0.015*
Associated with Severity of Dysmenorrhea				
School Absenteeism	Yes vs. No	Severity (Mild/Moderate/Severe)	33.428	0.001*
Source of Information	Mother, Teacher, Friends, etc.	Severity (Mild/Moderate/Severe)	21.463	0.006*
Coping: Bed Rest	Yes vs. No	Severity (Mild/Moderate/Severe)	18.736	0.001*
Coping: Self-medication	Yes vs. No	Severity (Mild/Moderate/Severe)	10.067	0.007*
Coping: Apply Massage	Yes vs. No	Severity (Mild/Moderate/Severe)	8.860	0.012*
Hospitalized due to pain	Yes vs. No	Severity (Mild/Moderate/Severe)	7.135	0.028*

*Statistically significant, p-value <0.05

4. Discussion

The objective of this study was to assess the prevalence of dysmenorrhea and its associated factors among secondary-level female students in Rapti Rural Municipality, Dang, Nepal. Approximately 86.2% of adolescent female students who experienced sick absence had dysmenorrhea. This aligns with studies conducted in Nepal. A cross-sectional descriptive study conducted in Chitwan reported a prevalence of 87.5% (Sigdel et al., 2023). Similarly, another study conducted in Chitwan reported a prevalence of 87.6% (Prasai et al., 2023). Our prevalence rate was also comparable to the 84% rate found among undergraduate young female medical students in Pokhara (Karmacharya et al., 2022).

The prevalence rate was found to be high in our study. It was higher than that of other studies conducted in Nepal. Some of them are technical schools in Dang (75.2%) (Baidhya & Prasad Paneru, 2020) and Pokhara Valley (71.5%) (Sharma et al., 2016). Similarly, Kathmandu University School of Medical Sciences, Chaukot (70.1%) (Jha & Gautam, 2024). The increased prevalence from 75.2% to 86.2% in the Dang district over 5 years indicates insufficient appropriate management and awareness regarding dysmenorrhea. There may be an increase in reporting of these issues due to a slightly reduced stigma, modifiable lifestyle factors, or academic stress among students.

Our prevalence in this study at 86.2% was found to be higher than the 74.5% reported from Kuala Lumpur, Malaysia (Wong and Khoo, 2010) but similar to the 85.7% for North Borneo, Malaysia (Azhary et al., 2022). Multiple studies from different parts of India showed a lower prevalence of 67.2% (Jailkhani et al., 2014), 76.1% (Singh et al., 2019), 62.7% (George et al., 2014), 62.3% (Wasnik et al., 2015) and 56% (Gandotra and Mahajan, 2020), though a single study in Indore, India, showed a similar prevalence of 84.2% (Kural et al., 2015).

Worldwide prevalence rates have differed substantially, with studies reporting rates as high as 93% in Egypt (Abdelmoty et al., 2015), 85.1% in Ethiopia (Shiferaw et al., 2014), 85.6% in Kuwait (Al-Matouq et al., 2019), 78% in Morocco (Lghoul et al., 2020), 94% in Poland (Barcikowska et al., 2020), 82.2% in Nigeria (Ezebialu et al., 2021) and 92.9% in France (Hadjou et al., 2022). The prevalence rates in North-west Ethiopia (69.3%) (Muluneh et al., 2018), Indonesia (25.4%) (Saida, 2024), Saudi Arabia (70.6%) (Alsaleem, 2018) and Spain (74%) (Fernández-Martínez et al., 2018) were lower. The differences can be attributed to differences of pain perception threshold, socio-cultural factors, lifestyle variations and methodological differences in defining and measuring dysmenorrhea.

In our research, 43.5% of the students experienced a severe level of pain, which is not similar to Dang by Baidhya and Prasad Paneru (2020), where half of the respondents experienced moderate pain (50.7%) and studies in Chitwan (Sigdel et al., 2023) and Indore, India (Kural et al., 2015) where respondents' majority experienced moderate pain. The finding was similar to that of a study done in Saudi Arabia, where most of the respondents (35.2%) reported severe pain. The severity of pain differences may be because of differences in ethnicity, pain tolerance threshold, or availability of coping mechanisms in students.

The study results show a significant association between dysmenorrhoea and ethnicity ($\chi^2 = 12.69$, $p = 0.026$). However, the other studies in Nepal don't show a significant association (Baidhya & Prasad Paneru, 2020; Sharma et al., 2016). It suggests to imply that there are some cultural and genetic potentials in the ethnic composition of Rapti Rural Municipality.

Our results indicate a significant association between menstrual cycle length and dysmenorrhea ($\chi^2 = 6.729$, $p = 0.035$). Several studies (Nyirenda et al., 2023; Baidhya & Prasad Paneru, 2020; Azagew et al., 2020; Hu et al., 2020) show similar findings. According to the study's findings, a family history of dysmenorrhea was significantly associated with the condition itself ($\chi^2 = 20.358$, $p = 0.001$). This finding is consistent with studies done in Ethiopia (Shiferaw et al., 2014), Zimbabwe (Nyirenda et al., 2023), India (Kural et al., 2015) and various places in Nepal (Jha & Gautam, 2024; Sigdel et al., 2023; Karmacharya et al., 2022; Baidhya & Prasad Paneru, 2020). The family history of dysmenorrhea is a consistent finding across studies and an important risk factor.

According to Saida (2024) and several others, subjects' age, household income, age at menarche, menstrual flow, and even BMI appear to be associated with how experts arrive at such conclusions. Fernández-Martínez et al. (2018), Sigdel et al. (2023) et Barcikowska et al. (2020) font de plus ou moins les mêmes observations. In our study, we did not find any statistically significant correlation between age and dysmenorrhea grades. This finding aligns with a study conducted in Telangana, India (Anusha et al., 2021). However, that same study did find a significant correlation of age at menarche with dysmenorrhea grades, which is contrary to our finding.

In our research, we found a significant association between the severity of dysmenorrhea and school absenteeism ($\chi^2 = 33.428$, $p = 0.001$). This is consistent with a previous study by Ghandour et al. (2024) on adolescent girls in Palestinian refugee camps, Hadjou et al. (2022) who studied high school girls from France, Abdelmoty et al. (2015) on secondary school girls in Egypt, Ezebialu et al. (2021) who studied female university students from Nigeria and Sharma et al. (2016) who studied the girls from Pokhara valley.

A different study also found that school absenteeism is very common due to dysmenorrhea in North-west Ethiopia (Azagew et al., 2020). Sixty-five per cent of the students were found to be absent from school due to their condition.

In our study, 10.4% of the respondents practised self-medication, and the severity of dysmenorrhea was significantly associated with self-medication ($\chi^2 = 10.067$, $p = 0.007$). This outcome aligns with studies in female nursing students from Dhanusha (Chaurasia et al., 2021) and in Spanish female university students (Fernández-Martínez et al., 2018). As indicated by a recent research study by Sigdel et al. (2023), our respondents practised non-pharmacological remedies, such as massage therapy and heat therapy, more often than pharmacological remedies, favouring traditional management of the condition.

5. Conclusion

This study reveals that dysmenorrhea is not merely a common occurrence but a severe and disruptive public health issue among adolescent girls in Rapti Rural Municipality, with a staggering 86.2% prevalence and nearly half (43.5%) of affected students experiencing severe pain. This high burden of pain is significantly influenced by factors such as family history, ethnicity, and an irregular menstrual cycle, and it directly translates into substantial school absenteeism and the use of inadequate coping strategies like self-medication.

Although dysmenorrhea is not a life-threatening health condition, the findings suggest that it is a major public health problem among female school-going adolescents, causing social burden on families and students, highlighting the need for better awareness, recognizing symptoms early, and improving practical support in schools to help manage this common but often neglected issue.

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