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Research Article

Prevalence Of Dysmenorrhea And Factors Associated With Its Intensity And Duration Among Female Students

Dr. Barkha Devi[1*], Ms Sonam Zangmu Sherpa[2], Ms Prerna Karki[3], Ms Nazung Lepcha[4], Ms Sujen Century[5], Ms Narmaya Chettri[6]

[1*]Associate Professor, Dept. OBG Nursing Sikkim Manipal College of Nursing Sikkim Manipal University, Sikkim-737102
[2]Associate Professor, Dept. OBG Nursing Sikkim Manipal College of Nursing Sikkim Manipal University, Sikkim-737102
[3]Associate Professor Sikkim Manipal College of Nursing Sikkim Manipal University, Sikkim-737102
[4]Assistant Professor Sikkim Manipal College of Nursing Sikkim Manipal University, Sikkim-737102
[5]Tutor Sikkim Manipal College of Nursing Sikkim Manipal University, Sikkim-737102
[6]Tutor Sikkim Manipal College of Nursing Sikkim Manipal University, Sikkim-737102

*** Corresponding author:** Dr. Barkha Devi,
Associate Professor, Sikkim Manipal College of Nursing, Sikkim Manipal University, Gangtok, Sikkim, India,
Email-barkha.d@smims.smu.edu.in, Mobile No. 7479278673

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ABSTRACT

Introduction: The most typical gynecological issue affecting women is dysmenorrhea, which is characterized by lower abdominal cramping that happens either before or during menstruation. Nearly half of women who experience dysmenorrhea skip work or school at least once each cycle. In the north-eastern region of India, the prevalence of dysmenorrhea has not yet been thoroughly examined. Dysmenorrhea affects 16.8 to 81% of women, according to the WHO.

Aims/Objective: The purpose of this study was to determine the prevalence of dysmenorrhea and the factors asssicated with it among female students. We also looked for correlations between the intensity and duration of the menstrual period and its association with socio-demographic data and menstrual characteristics.

Methods and Materials: In 2022, 202 healthy females between the ages of 18 and 26 who were selected through purposive sampling technique from the female hostel, Sikkim, for the study. To gather pertinent information, standardized self-reporting questionnaires were used. The Numerical Pain Rating Scale (VAS) was used to measure the severity of the pain and a five-point menstrual symptoms scale was used to measure the duration of the symptoms. SPSS version 20 was used to analyze the data.

Results: The findings indicated that dysmenorrhea was 77% prevalent. Additionally, it was discovered that there were more students with dysmenorrhea in the 18–23 year age group than in any other, but this difference was not statistically significant ($P > 0.05$) across all age groups. Back pain and abdominal pain both showed a significant positive connection between pain severity and the length of menstrual symptoms ($P < 0.001$ and $P < 0.05$, respectively). Both the age at which dysmenorrhea first appeared ($P < 0.001$) and the use of anti-dysmenorrhea medication ($P < 0.001$) were associated to the condition.

Conclusion: Female students in the research area had a significant prevalence of dysmenorrhea. Younger age, prolonged menstrual flow, age of onset of dysmenorrhea, and usage of painkillers were associated with dysmenorrhea.

Keywords: dysmenorrhea, prevalence, adolescents, menstruation, menstrual symptoms, management

Introduction

Dysmenorrhea is a recurrent lower abdomen or pelvic discomfort that can happen before, during, or both menstrual cycles. It can also radiate to the back and thighs. After regular ovulation has been established, lower abdomen cramps and pain are felt. Soon after menarche, it starts. It is the most prevalent gynecologic condition in female adolescents and adults. Menstruation-associated symptoms include a wide range of mental and physical issues that appear around menstruation. Menstrual symptoms include headaches, nausea, fatigue, dizziness, and diarrhea is a few that are frequently felt. The first 24 to 48 hours after the initiation of menstrual flow, or within a few hours before or after, are usually characterised by symptoms. [1,2]

Since different women experience dysmenorrhea differently and because there are many distinct diagnostic criteria that are frequently utilized, it is challenging to determine the epidemiology of the condition. Estimates of prevalence for women and adolescents range from 25 to 90%. [3] According to studies from India, the prevalence ranged from 50 to 87.8%[3,4,5,6,8]. According to other studies, dysmenorrhea can afflict up to 90% of women who are fertile to varied degrees. [8] Those who experience severe dysmenorrhea or discomfort that keeps them from engaging in their regular activities report significant pain in 5-20% of cases. [2]

Although studies conducted in various populations have reported prevalence rates ranging from 20% to 94%, dysmenorrhea's frequency is unknown and appears to have an effect on both public and occupational health[8,9]. The study populations' ethnic, socio-cultural, or biological characteristics [4,5] as well as the variety of dysmenorrhea classifications, may account for this large diversity.[14] Dysmenorrhea is defined as "the necessity for medicine and the inability to function normally in contrast to normal menstrual pain. According to a recent large-scale survey, reporting painful periods was more common than reporting difficult periods,[15] showing that discomfort alone does not indicate a clinical concern for a period. As a result, using a visual analogue scale (VAS)[16,17] to categorise dysmenorrhea on the basis of pain severity ignores a woman's ability to manage discomfort, which may make it difficult to determine if a woman needs medicine or can carry on with regular activities while experiencing dysmenorrhea.[16]

Different definitions of the condition make it challenging to quantify the prevalence of dysmenorrhea, with estimates ranging from 45% to 95%.[18]A recent systematic assessment of the international literature on persistent pelvic discomfort found that between 17% and 80% of women experience dysmenorrhea. [19] Several additional risk factors for dysmenorrhea have also been identified by prevalence studies, including body mass index (BMI), smoking, early menarche, prolonged monthly flow, and psychiatric disorders. [20]

In India, the precise prevalence of dysmenorrhea has not yet been determined. According to Nag, 33.5% of adolescent girls in India have dysmenorrhea. [21]George and Bhaduri discovered that dysmenorrhea was 87.7% prevalent in India. [22] Similar results among rural married women of Andhra Pradesh had been reported by Jayashree and Jayalakshmi. [23]

Although dysmenorrhea is a common gynecological problem in young females but there are limited studies in this subject especially in Northern part of India and in Sikkim. It is unclear the extent to which young girls are incapacitated each month due to the severity of dysmenorrhea. Hence, this raises a need to evaluate the menstrual characteristics and prevalence of dysmenorrhea in young college going females in Sikkim to provide evidences of the severity and duration of the problem.

Although dysmenorrhea is a prevalent gynaecological issue in young women, there aren't many research studies on the topic, especially in Sikkim and the northern region of India. Uncertainty involves the degree to which severe dysmenorrhea impairs young girls each month. Therefore, in order to demonstrate the severity and persistence of the issue, it is necessary to assess the menstrual features and prevalence of dysmenorrhea in young female students in Sikkim.

The objective of this study was

1. To ascertain the prevalence of dysmenorrhea and menstrual characteristics of female students
2. To identify the intensity and duration of dysmenorrhea pain among female students
3. To find correlation between the intensity of pain and duration of menstrual among female students
4. To determine association between severity of dysmenorrhea with socio-demographic and menstrual characteristics of female students

Operational Definition

1. **Dysmenorrhea**: - In this study, it refers to painful menstrual cramps experienced by students usually begins just after the onset of menstrual period for a consecutive period of 3 months as measured by baseline variables and recall past experience.
2. **Severity of dysmenorrhea**: To measure the intensity of dysmenorrhea, a 10-point Visual Analog Scale (VAS) was used to represent the continuum of female nursing student perception of degree of pain and classified as mild 0- no pain, 1–3, moderate 4–6 and severe 7–10.[13] The severity of pain was examined the first three days of menstrual bleeding
3. **Duration of dysmenorrhea:** To measure the pain duration from the onset of uterine cramps until they ended in terms of back pain and abdominal pain, the Menstrual Symptoms Questionnaire: score 0: no pain; score 1: ≤0-5 hours of pain; score 2: 0.5-1 hours of pain; score 3:>1 hour of pain; score 4: >1 day of pain.

4. **Baseline variables**: It refers to demographic, personal characteristics and menstrual characteristic of students

Methods and Materials

The present study was institutional based observational study conducted at Female student's hostel, Sikkim, India, 2022. All female Students residing in Hostel, Gangtok, Sikkim, India were used as source populations. Two hundred and two healthy females female students aged 18-28 years formed the study population out of 264. A purposive sampling technique was adopted to select unmarried girls who volunteered to give complete and correct information were included for the study. The eligibility criteria was female students who lived in hostel, with primary menstrual pain without significant pathology for at least 3 menstrual cycles, onset of pain either lower abdominal or pelvic pain associated with onset of menses and lasting for 9–72 hours were recruited. Written informed consent was obtained from all the females female students before commencement of the study. Prior to the distribution of the questionnaire, a brief orientation lecture was conducted for the samples and explained about the purpose of the study and were requested to complete the questionnaires to gather information. Data were collected using a pretested structured self-administered questionnaire developed based on review of the related literature. The questionnaire contained items on socio-demographic and economic factors, menstrual characteristics of students, menstrual characteristics, severity and duration of dysmenorrhea was measured using a 10-point visual analogue scale (VAS) and 4 point Menstrual Symptoms scale. A questionnaire regarding details of menstrual cycle was filled up by the participants in the presence of members of the study team by recalling the past menstruation. On the same day the self reported VAS and Menstrual Symptoms Questionnaire was handed over to the 202 students and were instructed to fill the questionnaire after the commencement of the menstruation as day one till day three for one cycle to observe and measure the severity and duration of pain. The participants were asked to rate the degree of pain by making a mark on the line. The scores received from the scale were classified into mild dysmenorrhea if it was between 1 and 3 points moderate between 4 and 6 points, and severe between 7 and 10 points for severity and the score 0: no pain; score 1: ≤0-5 hours of pain; score 2: 0.5-1 hours of pain; score 3:>1 hour of pain; score 4: >1 day of pain for duration of Dysmenorrhea.

The collected questioners first manually checked for completeness, and then the data was coded in Excel sheet and exported to SPSS version 20 for data analysis. The descriptive statistics, such as frequency, percentage, mean, standard deviation were performed to describe study population. The categorical and quantitative data was analyzed using Chi-sq and correlation test. The study proposal was cleared from Institutional Ethics Committee board of the Institute.

Result

Section I: Socio-demographic characteristics of the respondents
N=264

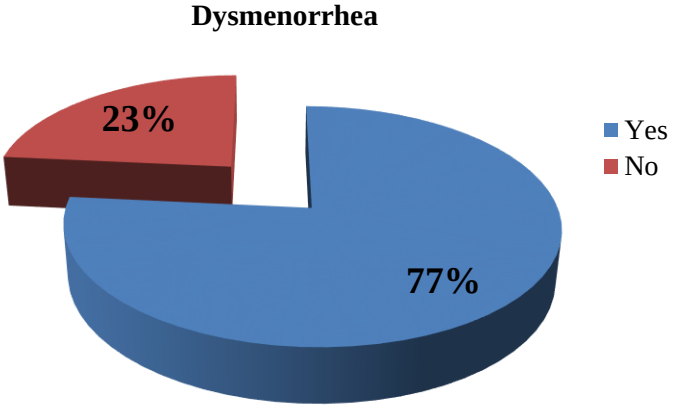

Figure 1 Distribution of female students in terms of presence of dysmenorrhea

Figure 1 shows Sixty-two of these 264 subjects (23%) reported that they had never experienced dysmenorrhea, while 202 (77%) reported having experienced dysmenorrhea. It is estimated that prevalence of dysmenorrhea varies from 20% to 95%. The results of the present study confirm the same, as dysmenorrhea was seen in majority of the female students (77%). The variation of prevalence was due to a different diagnostic tool or different attitude toward menstruation. Similar high prevalence (67.2%) was reported by Sharma et al., and Harlow and Park (71.6%). A Cochrane systematic review of studies in developing countries reported prevalence of dysmenorrhea in 25% to 50% of adult women.[13] On the other hand, studies from the developed countries also reported a wide range of 60% to 73%.

Table 1: Demographic and menstrual characteristics information about the female students n=202

Sl.No.	Background Information	Frequency *(f)*	Percent %
1	**Age in Years**		
a	18-20	86	43
b	21-23	99	49
c	> 23	17	8
2	**Age at menarche (in years):**		
a	10-12-	76	37.60%
b	13-15	118	58.40%
c	16-19	8	3.96%
3	**Length of menstrual cycle (in days):**		
a	20-27	9	4.45%
b	28-35	169	83.60%
c	36-42	14	6.93%
d	>43	9	4.45%
4	**Duration of menstrual flow (in days):**		
a	2-5-	118	58.40%
b	6-9-	80	39.60%
c	10-13-	2	0.99%
d	>14	2	0.99%
5	**Family history of dysmenorrhea**		
a	**Yes**	85	42.0
b	**No**	117	58.0
6	**Age of onset of dysmenorrhea (in years):**		
a	10-12-	55	27.20%
b	13-15-	91	45.04%
c	16-19-	51	25.24%
d	>20	5	2.47%

Table 1 provides participants general and family information. The proportion of participants belonging to the three age categories (18-20 and 21-23) were essentially similar except student belonged to the age more than 23. Nearly half of the subjects had attend there menarche at the age 13 to 15 years (58.4%). Majority of the students reported there length of menstrual cycle as 28 to 35 days (83.6%) whereas it is seen that the length of menstrual cycle was abnormally more than 43 days in 4.45% students. it was also reported that majority of this students had duration of menstrual flow within 2 to 5 days (58.4%) and 6 to 9 days (39.6%)

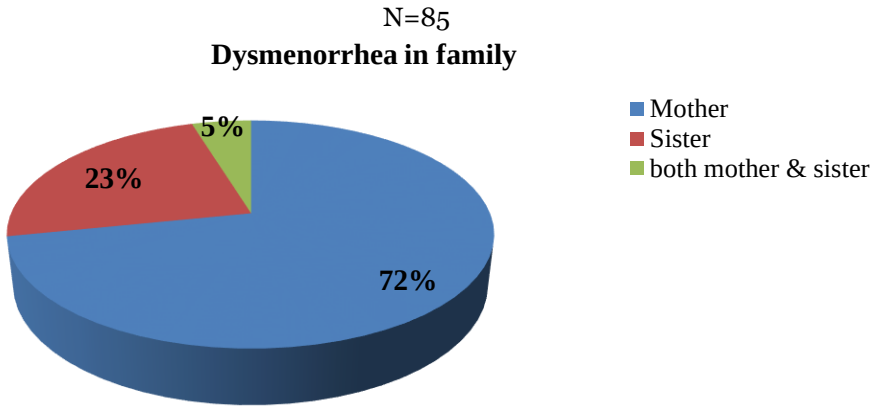

Figure 2 Distribution of female students in terms of presence of dysmenorrhea in immediate family

It was unexpected to learn that a considerable percentage of the selected female students (42%), indicated having a favorable family history of dysmenorrhea. Figure 2 illustrates the relation of female students with the immediate family member suffering from dysmenorrheal among which 72% of mothers, 23% of sisters, and 5%

of both mothers and sisters had the history of dysmenorrhea.

Section II: Reproductive characteristics and menstrual patterns of the participants

Table 2: Distribution of female students for menstrual characteristics

n=202

Sl.No	**variables**	Frequency *(f)*	Percent %
1	**Menstruation regular?**		
a	Yes	175	87%
b	No	27	13
2	**H/o taking oral contraceptive pills**		
a	Yes	10	5
b	No	192	95
3	**H/o having severe gastrointestinal disorders**		
a	Yes	19	9
b	No	183	91
4	**H/o gynecological diseases:**		
a	Yes	12	6
b	No	190	94
5	**H/o taking herbal remedies**		
a	Yes	32	16
b	No	170	84
6	**H/o abdominal/ pelvic major surgery**		
a	Yes	4	2
b	No	198	98
7	**Menstrual symptoms**		
a	Headache –	63	31.2
b	Nausea -	75	37.1
c	Vomiting -	25	12.4
d	Diarrhea -	45	22.3
e	Fatigue -	115	56.9
f	Discomfort -	147	72.8
g	Unable to attend daily chores during menstrual time	89	44.1
h	back pain	33	58.92
i	constipation	4	7.14
j	mood swing	15	26.78
k	breast tenderness	3	5.35
l	lower abdomen & leg pain	5	8.92
m	abdominal pain	2	3.57
8	**Habit of tea/coffee**		
a	Yes	114	56.4
b	No	87	43.1

It was reported in table 2 that 87% of female students are having regular menstruation whereas 13 % reported having irregular menstruation. Nearly, 95% of the study participants had never used hormonal contraceptives. It was also reported that nearly one tenth of the female students had history of severe gastrointestinal disorders (9%), gynecological disorder (6%) and pelvic surgery (2%) respectively. Approximately, 16 % of the female students had history of taking herbal remedies. The most common symptom present in female students during the menstrual periods was discomfort (72.8%) and second most prevalent symptom was back pain (58.92%) followed by fatigue (56.9%). The uterine contraction that occurs during menstruation is painful is generally accompanied with other symptoms, including leaving task undone (44.1%), nausea (37%), headache (31.2%mood swings (26.78%), diarrhea (222.3%) , vomiting (12.4%) tender breasts (5.35%) , general pain (8.92%) abdominal pain (3.57%) and Constipation (7.14) . Dysmenorrhea is usually associated with menstrual

symptoms; however, in the present study majority of them have reported multiple symptoms therefore the total percentage doesn't come to 100. Nearly half of the participants (56.4%) have habit of taking tea or coffee during menstruation

Table 3: Menstrual pain management behaviors of the selected females n=202

1	**Medication to reduce dysmenorrhea**		
a	Yes	49	24.3
b	No	153	75.74
1a	**If Yes, please specify name and dose**		
i	Name & dose		
	Metal spas (MS)-250mg	43	87.75%
	PCM-500-650mg	4	8.16%
	ZERODOL(ZS)-180mg	1	2%
	Brufen (IBU) -200mg	1	2%
iii	**Frequency of medication**		
	i. Metal spas (MS)-250mg		
	Sos	1	2%
	Once	39	90.69%
	Twice	3	6.97%
	ii. PCM- 500-600mg		
	Once	4	100%
	iii. ZERODOL(ZS)-180mg - twice	1	100%
	iv. Brufen (IBU) - once	1	100%
iv	**MENTION DAY**		
MS	Day 1	30	69.76%
	Day2	3	6.97%
	Day1,2	10	23.20%
PCM	Day 1	2	50%
	Day 2	2	50%
ZS	Day1	1	100%
IBU	Day 1	1	100%
2	Menstrual pain management with Non pharmacological Methods		
a	Yes	111	55.0
b	No	91	45.0

Management of pain adopted by the selected female students is also presented in Table 3. It is obvious that a small proportion of students that is 24.3% reported to have self selected medicine without doctor's consultation. Out of that 87.75% used Meftal spas 250 mg, once a day (90.69%) on day 1 of the dysmenorrheal as shown in Table 3.

n=202

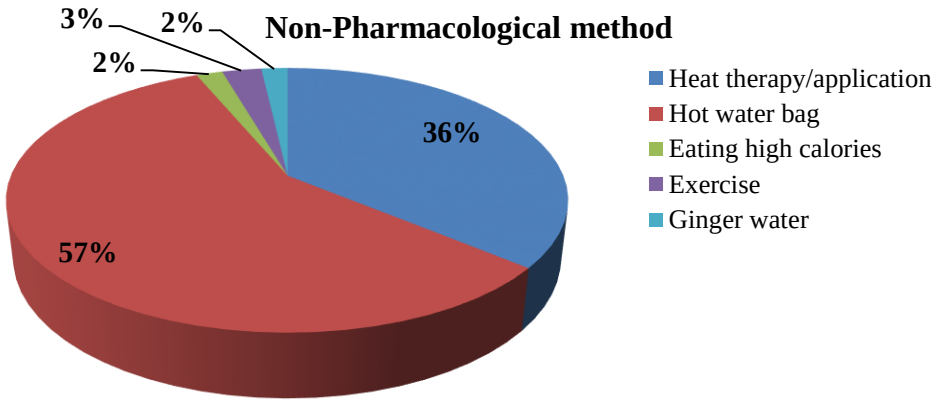

Figure 4 Distribution of female students in terms of measure used to reduce dysmenorrheal

Majority of dysmenorrheic female students practiced non- pharmacological methods (55 %) among which, having hot water bag (57%), use of heat therapy (36%), exercise (3%) and eating high calorie diets (2%) and taking ginger water (2%) as a measure to relieve pain as shown in Figure 4.

Section VI: Patterns of dysmenorrhea among the participants

- Intensity of Pain
- Duration of Menstrual Symptoms

n=202

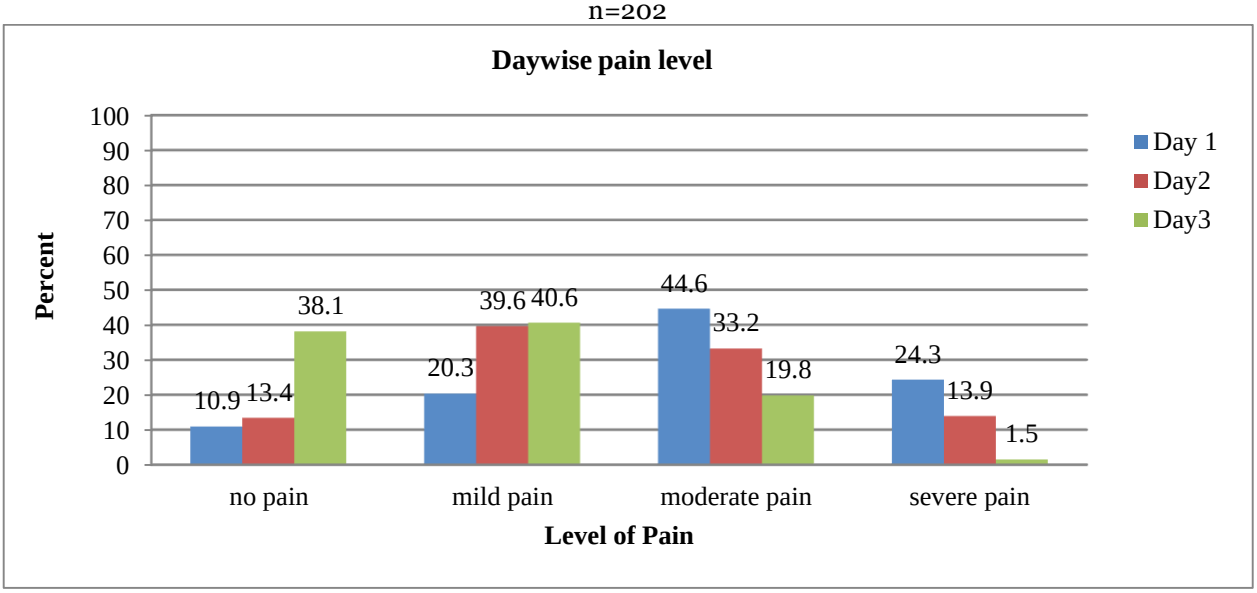

Figure 5 Distribution of female students in terms of severity of pain

Although measuring pain is highly challenging, all study participants who experienced dysmenorrhea were asked to complete a VAS gradient of pain questionnaire. 77% of female students reported having dysmenorrhea, and 24.3% of them reported having "serious pain," defined as a visual analogue score between 7 and 10. About 44.6% of people reported having moderate pain, defined as 4 to 6, and the remaining 20.3% felt mild pain (1–3).

Table 4 Distribution of the subjects according to the duration of menstrual symptoms- Abdominal Pain

n=202

Menstrual Symptoms score day wise						
Abdominal pain	**Day 1**		**Day 2**		**Day 3**	
	Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
• no pain	37	18.3	46	22.8	111	55.0
• Pain for first half an hr	21	10.4	52	25.7	42	20.8
• Pain for more than half hr to 1 Hour	27	13.4	31	15.3	13	6.4
• Pain stays for more than 1 hr	34	16.8	31	15.3	25	12.4
• Pain stays for >1 day	83	41.1	42	20.8	11	5.4

Regarding the duration of the abdominal pain, majority of female students (41.1%) have reported onset of abdominal pain on day 1, 20.8% and 5.4 stated on both day 2 and day 3 whereas nearly half of the participants on day 3 had reported decrease in abdominal pain. Thus, maximum numbers of female students were suffering on day 1 of menstruation in the present study.

Table 5 Distribution of the subjects according to the duration of menstrual symptoms- Back Pain

n=202

Menstrual Symptoms score day wise						
Back pain	**Day 1**		**Day 2**		**Day 3**	
	Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
• no pain	56	27.7	58	28.7	103	51.0
• Pain for first half an hr	15	7.4	42	20.8	44	21.8
• Pain for more than half hr to 1 Hour	27	13.4	24	11.9	17	8.4
• Pain stays for more than 1 hr	22	10.9	24	11.9	14	6.9
• Pain stays for >1 day	82	40.6	54	26.7	24	11.9

Majority of female students (40.6%) have reported onset of back pain on day 1, 26.7% and 11.9% stated on both day 2 and day 3 whereas majority of the female students (28.7%) did not experience any pain on day 2 and nearly half of the participants on day 3 (51%) had reported no back pain. Thus, maximum numbers of female students were suffering from back pain on day 1 of menstruation in the present study.

Section VI: Correlation between intensity of pain and duration of menstrual symptoms

Table 6 Correlation between intensity of pain and duration of menstrual symptoms in dysmenorrhea among female students

n=202

Day 1	Mean	Std. Deviation	Pearson Correlation	Sig. (2-tailed)
• Severity of pain level	5.12	2.601	.526**	.000
• Duration of Menstrual symptoms scale-Abdominal pain	2.52	1.546		

**. Correlation is significant at the 0.01 level (2-tailed)

n=202

Day 1	Mean	Std. Deviation	Pearson Correlation	Sig. (2-tailed)
• Severity of pain level	5.12	2.601	.282**	.000
• Duration of Menstrual symptoms scale - Back pain	2.29	1.687		

**. Correlation is significant at the 0.01 level (2-tailed)

Significantly more female students reported having significant pain, and those who did said that their pain started on day one and lasted for a long time. This is clear evidence of the suffering dysmenorrheic female student's experience, which is inversely related to their levels of mild, moderate, and severe dysmenorrhea. On Day 1, we discovered a weakly positive correlation between the severity of pain level and the onset and duration of menstrual symptoms scale-abdominal pain, but an extremely significant correlation between the two with a r value of 0.526 at the 0.01 level of significance. This suggested that as pain severity increases, both abdominal and back pain last longer.

Table 7 Correlation between intensity of pain and duration of menstrual symptoms in dysmenorrhea among female students

n=202

Day 2	Mean	Std. Deviation	Pearson Correlation	Sig. (2-tailed)
• Severity of pain level	2.38	1.668	.234**	.001
• Duration of Menstrual symptoms scale-Abdominal pain	1.86	1.464		

**. Correlation is significant at the 0.01 level (2-tailed)

n=202

Day 2	Mean	SD	Pearson Correlation	Sig. (2-tailed)
• Severity of pain level	2.38	1.668	.220**	.002
• Duration of Menstrual symptoms scale - Back pain	1.87	1.594		

**. Correlation is significant at the 0.01 level (2-tailed).

We found positively significant correlation between severity of pain level and onset and duration of abdominal pain- whereas poorly positive correlation was found between severity of pain level and onset and duration of back pain on Day 2.Considering the lowest level of pain in day two causes decrease number of menstrual pain duration among participants, Which inferred that as the severity of pain decreases there is decrease in duration of abdominal and back pain.

Table 8 Correlation between intensity of pain and duration of menstrual symptoms in dysmenorrhea among female students

n=202

Day 3	Mean	Std. Deviation	Pearson Correlation	Sig. (2-tailed)
• Severity of pain level	1.36	1.619	.288**	.000
• Duration of Menstrual symptoms scale-Abdominal pain	.93	1.265		

**. Correlation is significant at the 0.01 level (2-tailed).

n=202

Day 3	Mean	Std. Deviation	Pearson Correlation	Sig. (2-tailed)
Severity of pain level	1.36	1.619	.264**	.000
Duration of Menstrual symptoms scale - Back pain	1.07	1.395		

** Correlation is significant at the 0.01 level (2-tailed).

On Day 3, we discovered a strong positive correlation between the intensity of pain and the beginning and duration of abdominal pain, but a weakly positive correlation between the intensity of pain and the onset and duration of back pain. Considering the lowest level of pain in day three causes decrease number of menstrual pain duration among participants, which inferred that as the severity of pain decreases, there is decrease in duration of abdominal and back pain.

Table 9: Association between selected factors and pain among female students

n=202

Sl.No.	Background Information	Pain		Chi Sq	df	P-value
1	**Menstruation regular?**	Yes	No			
a	Yes	157	18	.017	1	1.000NS
b	No	24	3			
2	**H/o taking oral contraceptive pills**					
a	Yes	9	0	1.093	1	.602 NS
b	No	172	21			
3	**H/o having severe gastrointestinal disorders**					
a	Yes	17	2	.000	1	1.000 NS
b	No	164	19			
4	**H/o gynecological diseases:**					
a	Yes	11	1	.058	1	1.000 NS
b	No	170	20			
5	**H/o taking herbal remedies**					
a	Yes	28	4	.181	1	.751 NS
b	No	153	17			
6	**H/o abdominal/ pelvic major surgery**					
a	Yes	2	1	1.720	1	.282 NS
b	No	179	20			
7	**Habit of tea/coffee**					
a	Yes	102	12	.005	1	1.000 NS
b	No	79	9			
8	**Age in Years**					
a	18-20	30	56	5.455	2	.065NS
b	21-23	42	57			

c	> 23	6	11			
9	**Age at menarche (in years):**					
a	10-12	31	45	1.811	3	.613 NS
b	13-15	46	72			
c	16-19	1	7			
10	**Length of menstrual cycle (in days):**					
a	20-27	9	0	1.201	3	.753 NS
b	28-35	154	19			
c	36-42	11	1			
d	>43	7	1			
11	**Duration of menstrual flow (in days):**					
a	2-5	107	12	5.244	3	.155 NS
b	6-9	71	7			
c	10-13	2	1			
d	>14	1	1			
12	**Family history of dysmenorrhea**					
a	**Yes**	76	9	.006	1	1.000 NS
b	**No**	105	12			
13	**Age of onset of dysmenorrhea (in years):**					
a	10-12	42	12	11.342	3	**.010***
b	13-15	82	5			
c	16-19	52	4			
d	>20	5	0			
14	**Medication to reduce dysmenorrhea**					
a	Yes	49	0	7.506	1	**.003****
b	No	132	21			
15	**Pain management with Non pharmacological Methods**					
a	Yes	103	8	2.690	1	.111 NS
b	No	78	13			

The relationship between specific demographic and menstrual characteristics and the intensity of menstrual pain is shown in Table 9. Both the age at which dysmenorrhea first appeared (P <0.001) and the use of anti-dysmenorrhea medication (P <0.001) were related to the condition. Additionally, no statistically significant association was found between dysmenorrhea and menstruation regularity, history of using oral contraceptives, severe gastrointestinal disorders, gynaecological diseases, using herbal remedies, undergoing major abdominal/pelvic surgery, drinking tea or coffee regularly, age at menarche (in years), length of menstrual cycle (in days), duration of menstrual flow (in days), family history of dysmenorrhea, or non-pharmacological pain management.

Discussion

The present institution-based study was conducted in the Female Student hostel, and aimed at determining the prevalence of dysmenorrhea and menstrual characteristics associated with its intensity and duration among female students of Sikkim. A total of 264 students were interviewed and results showed that 202 had reported the presence of dysmenorrhea (77%) on the recall basis. Out of 202 female students, 89.10% had reported pain during first day of menstruation whereas on day 2, 86.63 % of the female students reported pain. Dysmenorrhea is a common problem among women of reproductive ages and is also very common among adolescents of school age. There is a wide variation in the prevalence of dysmenorrhea in different studies around the world. [16,24,25] Different independent studies conducted in our country also showed various estimates of dysmenorrhea among students, ranging from 58.5% to 85.5%.[26] In various research conducted all across the

world, the prevalence of dysmenorrhea varies greatly. [16,24,25] Various estimations of dysmenorrhea among female students, ranging from 58.5% to 85.5%, were also found in independent research carried out in our country. [26]

In this study, dysmenorrhea was 77% prevalent. Additionally, the study discovered that young female nursing college students had a greater prevalence of dysmenorrhea. [27] This can be brought on by the disparities in sample size and age. Students in an Indian study range in age from 18 to 21. The age range in this study, however, is 18 to 26 years. Dysmenorrhea most commonly affects people between the ages of 18 and 23. [28] According to some research, the prevalence of dysmenorrhea declines with age, suggesting that the condition peaks in late adolescence by the early 20s and subsequently declines with age. [29] The current study also revealed that there were more girls with dysmenorrhea between the ages of 18 and 23 compared to later, but this difference was not statistically significant ($P > 0.05$) among age ranges.

The prevalence in this study was, however, somewhat less than that found in earlier studies by Benin (78.1%), Oman (94.0%), Kuwait (85.6%), and Romania (78.1%). The socio-cultural variances in how the study participants perceived discomfort during their periods and lifestyle variations may be to blame for the inconsistencies in the predicted prevalence. This discrepancy is likely caused by the fact that dysmenorrhea prevalence is higher in teens and declines with age, but research among university students' age ranges between 18 and 29 years. [11,30-32,27]

In this study, approximately 44% of the female students had their daily activities disturbed. This frequency is close to the frequency of 86.31% obtained by Narring in Swaziland. Studies have demonstrated that menstrual pain restricts the movement and usual activity pattern of the females. It could also be argued that the perception of uneasiness and discomfort experienced during menstruation probably limits the movements more than the experience of pain. [34]We found discomfort, fatigue and ability to do daily chores as the most prevalent menstrual symptoms and our observations were similar to that reported by others.[34]

Menstrual duration of 2 to 5 days or longer, on the other hand, was a major risk factor for dysmenorrhea but was not found to be significantly related to pain severity in the current study. Female students who experienced menstruation for more than five days had a higher risk of developing dysmenorrhea, which was followed by menstruation for six to nine days. This results is consistent with the observation that women with lengthy menstrual flows had a higher risk of developing dysmenorrhea.[35]

Despite the difficulties, only a small percentage of female students in our study (24.3%) sought pharmaceutical management, and 55% relied on non-pharmacological techniques.[35] This study discovered that none of the students sought medical care for dysmenorrhea. It is necessary to investigate the obstacles dysmenorrheic students face when seeking medical care. For many young girls in India and other countries, health education about puberty and menstruation is viewed as inadequate. The behaviour of dysmenorrheic females in seeking medical assistance could be negatively impacted by this misinformation. [36-39]

The current study discovered a significant positive link between abdominal and back pain severity and menstrual symptom duration (abdominal, $P< 0.001$ and back pain, $P<0.05$). Both the age at which dysmenorrhea first appeared ($P< 0.001$) and the use of anti-dysmenorrhea medication ($P< 0.001$) were related to the condition. Additionally, no statistically significant correlation between dysmenorrhea and any of the following factors was discovered: regular menstruation, history of using oral contraceptives, severe gastrointestinal disorders, gynaecological diseases, use of herbal remedies, and major abdominal/pelvic surgery, habit of drinking tea or coffee, age at menarche (in years), Menstrual cycle length (in days), Menstrual flow duration (in days), Family history of dysmenorrhea, and Non-pharmacological pain management methods.

It is evident from results that nearly 44.6% and 24.3% of female students experienced moderate to severe dysmenorrhea on day 1 and 33.2 and 13.9 had on second day. While comparing prevalence of dysmenorrhea from other countries, Ethiopia reported 70% dysmenorrhea wherein 28.5% had moderate to severe, Malaysia reported an incidence of 6.8% having moderate to severe pain and Jordan reported 55.8% of the subjects had moderate to severe pain. One of the reasons for such vast differences could be due to the scales used for assessment[36,40,41]. In a study conducted by Ortiz in 1539 students of Mexican University, author concluded that dysmenorrhea was mild in 36.1%, moderate in 43.8% and severe in 20.1%.[42] According to Maitri Shah et al.[43], 18%, 40%, and 42% of female students, respectively, experienced mild, moderate, and severe pain (dysmenorrhea). 43 This shows that dysmenorrhea is still an important public health problem that may have an adverse effect on one's health, social life, career, and psychological well-being.

Limitations of the study

- Because all of the variables in this study were determined by the participants' self - report and experiences, there may have been some incidences when the condition was underreported.
- Only one female hostel was used for data gathering, hence the sample of female students may not be representative of all Sikkim colleges.

Conclusion

Female students living in the student nurses hostel had a high prevalence of dysmenorrhea. With age, among students with a relevant family history of the condition, and age of onset of the condition, dysmenorrhea became more prevalent. The majority of girls experienced menstrual symptoms on day one and two of the menstrual cycle, subjecting these women to prolonged discomfort and highlighting the severity of the issue, necessitating a suitable remedy through a change in lifestyle. There is a barrier to dysmenorrhoic females seeking medical consultation or treatment, as it was also highlighted in the study that none of the students sought medical attention for the severity of the pain and did the self-medication.

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References

1. Bernardi M, Lazzeri L, Perelli F, Reis FM, Petraglia F. Dysmenorrhea and related disorders. F1000Research. 2017; 6:1645. doi:10.12688/ f1000research.11682.1
2. Lefebvre G, Pinsonneault O, Antao V, et al. Primary dysmenorrhea consensus guideline. J Obstet Gynaecol Can. 2005;27(12):1117–1146
3. Weissman AMH, Hansen MDAJ, Johnson SR. The natural history of primary dysmenorrhoea: A longitudinal study. BJOG: An International Journal of Obstetrics & Gynaecology, 2004; 111(4), 345-352. http://dx.doi.org/10.1111/j.1471-0528.2004.00090.x
4. Reddish S. Dysmenorrhea. Aust Fam Physician. 2006; 35(11): 842–849. 20.
5. Coco AS. Primary dysmenorrhea. Am Fam Physician. 1999; 60(2): 489–496.
6. Jamieson DJ, Steeg JF. The prevalence of dysmenorrhea, dyspaurenia, pelvic pain and irritable bowel syndrome in primary care practices. Obstet Gynecol. 1996; 87(1):55–58.
7. Patel V, Tanksale V, Sahasrabhojanee M, Gupte S, Nevrekar P. The burden and determinants of dysmenorrhea: a population-based survey of 2262 women in Goa, India. BJOG. 2006; 113(4):453–463.
8. Burnett MA, Antao V, Black A, et al. Prevalence of primary dysmenorrhea in Canada. J Obstet Gynecol Can. 2005; 27(8):765–770.
9. Pitts MK, Ferris JA, Smith AM, Shelley JM, Richters J. Prevalence and correlates of three types of pelvic pain in a nationally representative sample of Australian women. Med J Aust. 2008;189(3):138–143.
10. Shiferaw MT, Wubshet M, Tegabu D. Menstrual problems and associated factors among students of Bahir Dar University, Amhara National Regional State, Ethiopia: a cross-sectional survey. Pan Afr Med J. 2014;17:67.
11. Al-Kindi R, Al-Bulushi A. Prevalence and impact of dysmenorrhoea among Omani high school students. Sultan Qaboos Univ Med J. 2011; 11 (4):485.
12. Hu Z, Tang L, Chen L, Kaminga AC, Xu H. Prevalence and risk factors associated with primary dysmenorrhea among Chinese female university students: a cross-sectional study. J Pediatr Adolesc Gynecol. 2020;33(1):15–22. doi:10.1016/j.jpag.2019.09.004
13. Polat A, Celik H, Gurates B, Kaya D, Nalbant M, Kavak E, et al Prevalence of primary dysmenorrhea in young adult female university students Arch Gynecol Obstet. 2009;279:527–32
14. Cakir M, Mungan I, Karakas T, Girisken I, Okten A. Menstrual pattern and common menstrual disorders among university students in Turkey. Ped Int. 2007; 49(6):938–942.
15. Ozerdogan N, Sayiner D, Ayranci U, Unsal A, Giray S. Prevalence and predictors of dysmenorrhea among students at a university in Turkey. Int J Gynecol Obstet. 2007; 107(1):39–43.
16. Ortiz MI. Primary dysmenorrhea among Mexican university students: Prevalence, impact and treatment Eur J Obstet Gynecol Reprod Biol. 2010;152:73–7
17. Okusanya BoGK, Gb O, Ohiosimuan O. Menstrual pain and associated factors amongst undergraduates of Ambrose Alli University Ekpoma, Edo State, Nigeria. Nigerian Journal of Medicine: Journal of the National Association of Resident Doctors of Nigeria, 2009; 18(4), 409-412.
18. George A, Bhaduri A. Dysmenorrhea among adolescent girls-symptoms experienced during menstruation Health Promot Educ. 2002;17:4
19. Patel V, Tanksale V, Sahasrabhojanee M, Gupte S, Nevrekar P. The burden and determinants of dysmenorrhea: A population-based survey of 2262 women in Goa, India BJOG. 2006;113:453–63
20. Nair PGV, Kannan A. Awareness and practices of menstruation and pubertal changes amongst unmarried female adolescents in a rural area of East Delhi. IJCM, 2007;32(2), 156-157. http://dx.doi.org/10.4103/0970-0218.35668
21. Nag RM. Adolescent in India 1982 Calcutta Medical Allied Agency:18–26

22. Singh A, Kiran D, Singh H, Nel B, Singh P, Tiwari P. Prevalence and severity of dysmenorrhea: A problem related to menstruation, among first and second year female medical students Indian J Physiol Pharmacol. 2008;52:389–97
23. Agarwal AK, Agarwal A . A study of dysmenorrhea during menstruation in adolescent girls. Indian Journal of Community Medicine: Official Publication of Indian Association of Preventive & Social Medicine 2010;35(1), 159-164. http://dx.doi.org/10.4103/0970-0218.62586
24. Righarts A, Osborne L, Connor J, et al. The prevalence and potential determinants of dysmenorrhoea and other pelvic pain in women: a prospective study. BJOG 2018; 125(12): 1532–1539.
25. Jiang W, Hua X-G, Hu C-Y, et al. The prevalence and risk factors of menstrual pain of married women in Anhui Province, China. Eur J Obstet Gynecol Reprod Biol 2018; 229: 190–194.
26. Berhe H, Bayray A, Ukbayohannes R, et al. Menstrual hygiene practice and associated factors among adolescent high school girls. J Bio-Innov 2016; 5(1): 1–15.
27. Shah M, Monga A, Patel S, Shah M, Bakshi H. A study of prevalence of primary dysmenorrhea in young students-A cross-sectional study Healthline. 2013;4:30–4
28. Dawood M. Dysmenorrhea the global library of Women's medicine. London: GLOWM, 2008.
29. Nur N, Sumer H. Prevalence of dysmenorrhea and related risk factors in adolescents. Surekli Tip Egitimi Dergisi 2008;7:27-30.
30. Sidi I, Hounkpatin B, Obossou A, et al. Primary dysmenorrhea in the schools of Parakou: prevalence, impact and therapeutic approach. Gynecol Obstet. 2016;6(376):2161–0932.1000376.
31. Al-Matouq S, Al-Mutairi H, Al-Mutairi O, et al. Dysmenorrhea among high-school students and its associated factors in Kuwait. BMC Pediatr. 2019;19(1):1–12. doi:10.1186/s12887-019-1442-6
32. Sima RM, Sulea M, Radosa JC, et al. The prevalence, management and impact of dysmenorrhea on medical students' lives—A multicenter study. Healthcare. 2022;10(1):157. doi:10.3390/healthcare10010157
33. Narring MF, Yaronb A E, Ambresinc. La dysménorrhée: un problème pour le pédiatre? Archives de Pédiatrien. 2012;19: 125-130.
34. Banikarim C, Chacko MR, Kelder SH. Prevalence and impact of dysmenorrhea on Hispanic female adolescents. Arch Pediatr Adolesc Med 2000;154:1226-9
35. Lee LC, Lee P, Kaur J. Menstruation among adolescent girls in Malaysia: A cross-sectional school survey. Singapore Medical Journal, 2006;47(10), 869-874
36. Ks Konapur CN. Dysmenorrhoea and Premensrtual Syndrome: Frequency and Effect on Daily Activities of Adolescent Girls in Rural Areas of Bangalore. International Journal of Medical Science and Public Health, 2014;3(10), 1225-1228. http://dx.doi.org/10.5455/ijmsph.2014.090720143
37. Aktaş D. Prevalence and Factors Affecting Dysmenorrhea in Female University Students: Effect on General Comfort Level. Pain Management Nursing, 2015;16(4), 534-543. http://dx.doi.org/10.1016/j.pmn.2014. 10.004
38. Farotimi AA, Esike J, Nwozichi CU, Ojediran TD, Ojewole FO. Knowledge, attitude, and healthcare-seeking behavior towards dysmenorrhea among female students of a private university in Ogun State, Nigeria. Journal of Basic and Clinical Reproductive Sciences, 2015;4(1), 33-38. http://dx.doi.org/10. 4103/2278-960X.153524
39. Zegeye BMA. Age at menarche and the menstrual pattern of secondary school adolescents in northwest Ethiopia. BMC Women's Health, 2009;9(29). http://dx.doi.org/10.1186/1472-6874-9-29
40. Al-Jefout MAF, Hijazeen S, Al-Qaisi, J, Al-Ma'aitah R, Al-Ma'aitah O, Luskomb GO. Dysmenorrhea: Prevalence & Impact on Quality of Life among Young Adult Jordanian Females. Journal of Pediatric and Adolescent Gynecology. 2014
41. Jamieson DJ, Steege JF. The prevalence of dysmenorrhea, dyspareunia, pelvic pain, and irritable bowel syndrome in primary care practices. Obstet Gynecol 1996;87:55-8.
42. Lu ZJ. The relationship between menstrual attitudes and menstrual symptoms among Taiwanese women. J Adv Nurs 2001;33:621-8