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Prevalence of primary dysmenorrhea and premenstrual symptoms in medical college students and its impact on academic performance and their willingness to seek help

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Abstract

Aim: Assess the prevalence and impact of primary dysmenorrhea and premenstrual symptoms on the academic performance of medical students and their willingness to seek help.

Method: An observational study was conducted among female medical students aged 18-29 years for 1 year. After written and informed consent, a standard questionnaire and Modified Menstrual Distress Questionnaire (MDQ) was used to assess the prevalence of primary dysmenorrhea and premenstrual symptoms and its impact on the academic life. And the willingness to seek help was assessed.

Findings: The prevalence of primary dysmenorrhoea was 41.5% in this study.62.02% had premenstrual symptoms.14.1% had absenteeism from college/ work for 1-2days per year, 14.1% had absenteeism for more than one week, 12.4% had lack of concentration and 10.5% suffered from social withdrawal. Disturbance in sleep routine and daily activities were noted in 12.7% and 9.5% of the participants respectively. The most common premenstrual symptoms were crying (9.9%). Premenstrual symptoms such as mood swings (8.9%), lack of decisiveness (6.5%), abdominal pain (19.4%), breast pain (8.2%) and insomnia (9.2%) were also noted. 9.8% exercised, 19.7% used hot shower, 5.1% used hot pack, and 33.4% used analgesics as a coping mechanism for dysmenorrhoea. 8.9% consulted a gynaecologist for the dysmenorrhoea and 91% did not consult as they were medical students and were aware of the condition themselves.

Conclusion: Primary dysmenorrhea and premenstrual symptoms are widely prevalent among the medical students.Larger study should be conducted to assess the prevalence of premenstrual symptoms and dysmenorrhea and guide them to seek professional help so as to reduce the impact on their social, physical, academic and mental health.

Keywords: Dysmenorrhea; Medical Students; Quality of Life; Academics

1. Introduction

Dysmenorrhoea is one of the most common gynaecological problems in reproductive women**.** Primary dysmenorrhea is defined as spasmodic pain that starts at the onset of menses without any underlying pelvic pathology. Secondary dysmenorrhea is diffuse or constant pain which occurs due to any underlying pelvic pathology such as endometriosis, chronic pelvic inflammatory disease, ovarian cyst, congenital anomalies, adenomyosis etc [1]. 50% of menstruating women and 90% of adolescents suffer from dysmenorrhea worldwide.[2].

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Primary dysmenorrhea usually affects adolescents and presents as sharp, intermittent pain in the suprapubic region radiating to the back of the legs. It starts 1 to 2 days prior to the onset of menstrual flow and can last upto 96 hours and can be associated with headache, nausea and vomiting.

Dysmenorrhea depending on the grade can affect the day-to-day life of the menstruating adolescents. Studies have reported that 14.7% of the participants suffering from dysmenorrhea had severe restricted daily activities [3]. 30-50% of female suffering from dysmenorrhea experience severe pain. It also has a negative impact on the social function including poor relation with family and friends and poor social activities.[4]

Studies have reported that primary dysmenorrhea not only have a negative impact on the quality of daily life but also hampers the academic performance of the menstruating females.Around 140 million hours are lost yearly from school or work due to dysmenorrhea. Recurrent school absenteeism, lack of concentration, inability to complete assignments, failure in an exam is common among the females suffering from primary dysmenorrhea [5, 6]. Dysmenorrhea can also lead to poor academic performance, poor quality of sleep, mood changes, anxiety and depression.[3]

1.1. Premenstrual symptoms

Premenstrual disorders including premenstrual syndromes (PMS) and premenstrual dysphoric disorder are certain mood symptoms and physical symptoms occurring in the luteal phase of the menstrual cycle and resolves after the onset of the menses. The prevalence of PMS is around 20-30 % among menstruating females. The symptoms should be present for two prospective menstrual cycles for diagnosis. The common symptoms of PMS are divided into psychological and physical symptoms. The most common psychological symptoms include fatigue, irritability, mood swings and depression. The most common physical symptoms are abdominal bloating, breast tenderness, acne and changes in appetite.PMS have direct and indirect economic costs for females in form of medical bills, missed work days, decreased productivity and impaired social functions.[7]

1.2. Menstural Distress Questionnaire (MDQ)

MDQ, initially developed by Moos, is a self-reported tool used to report the severity of menstrual symptoms experienced by women. It was classified into 8 subscales via a factor analysis- pain, impaired concentration, behaviour changes, autonomic reactions, water retention, negative affect, arousal and control. Later was modified into 6 subscales where control and arousal were removed. Each item was rated on a 6-point scale ranging from 1 (no symptoms) to 6 (very strong). The total scores of 6 subscales were calculated and the higher score meant more severe symptoms.[8]

Aims and Objectives

- Assess the prevalence of primary dysmenorrhea and premenstrual symptoms and its characteristics among medical college students.
- Impact of primary dysmenorrhea and premenstrual symptoms on the academic performance.
- Their willingness to seek help and if not the reason.

2. Materials and methods

An observational study was conducted among the medical students in MAMC New Delhi aged between 18-29 years for 1 year after obtaining clearance from Institutional ethics comittee. Those with history of abortion or pregnancy, chronic disease such as diabetes, diagnosed psychiatric condition (depression, anxiety) and secondary dysmenorrhea were excluded. Medical students were enrolled and a written informed consent was taken from all the students included in the study after explaining them the methodology. They were asked to fill the questionnaire. The questionnaire had two parts:

2.1. Part one

It included personal data, regularity of menstruation and other menstrual history

- Characteristics of dysmenorrhea
- Effect on academics and life
- Coping mechanisms used for pain

2.2. Part two

Assessment of Premenstrual symptoms via preformed questionnaire. Proforma was based on MODIFIED MENSTRUAL DISTRESS QUESTIONNAIRE (MDQ)[9]. It consists of 6 sub scales: Pain, Negative Effect, Lack of Concentration, Water Retention, Autonomic Reactions and Behaviour Changes.The respondent were required to rate each item on a 4-point scale (none, mild, moderate, or severe) which will be scored from 0 to 3. The 'degree' of the symptom was classified as

- **None**: not experienced, or experienced throughout phases of the cycle with no recognizable relationship to the premenstrual phase.
- **Slight**: experienced to a minor degree in premenstrual phase; no disturbance noted; no treatment sought or believed to be needed; symptom is regarded as trivial or minor and of no consequence to her or others.
- **Moderate**: experienced to a degree that is noticeable and necessitates the woman to alter her behavior in some way, e.g., take an aspirin, rest, seek relief; you regard the symptom as disturbing and needing some form of treatment.
- **Severe**: experienced to a degree that is incapacitating; marked disturbance of function necessitating a profound alteration in behavior and/or relationships; regards the symptom as very disturbing and requiring treatment.

3. Results

Table 1 Demographic details of the patients

Age group	Number of participants	Percentage
< 20 years	16	2.0
21-25 years	148	46.25
26-29 years	156	48.70
Designation		
UG	145	45.3
Intern	95	29.6
PG	80	25
BMI		
Underweight	12	3.75
Normal	162	50.6
Overweight	99	30.9
Obese	47	40.6
Socioeconomic Status		
Lower	0	0
Upper Lower	1	0.3
Lower Middle	24	7.5
Upper Middle	126	39.3
Upper	169	52.8
Marital Status		
Married	22	6.9
Unmarried	298	93.1
Known Medical / Menstrual / Psychiatric Conditions		
PMS – Premenstrual Symptoms	1	0.3

TOA- Tubo-ovarain abscess	1	0.3
PCOS- polycystic ovarian syndrome	12	3.8
Anemia	6	1.9
Asthma	3	1.0
Headache	1	0.3
hypothyroidsm	4	1.3
Hypothyroidism/asthma	1	0.3
migraine	4	1.3
Place of stay		
Hostel	177	56.4
Home	143	44.6
Area of residence		
Rural	40	12.5
Urban slum	5	1.25
Urban	275	85.9
Family history of premenstrual symptoms	37	11.5

This study was conducted among 320 undergraduates and residents in a medical college.The mean age in this study was 25.30±2.58 years and almost 50% of the study population were between 26-29 years. In this study approx 45.3% of them were undergraduates and 29.6% and 25% were intern and postgraduate students.Almost 50.6% belonged to normal BMI category (18-22.9kg/m2) and 30.9% belonged to overweight (23-24.9kg/m2). In this study, 53.7% belonged to upper class and 38.4% belonged to upper middle class in socioeconomic status. Almost 56.4% resided in hostel, 44.6% resided in home and 85.7% belonging to urban areas of residence. Majority of the study population that is 93% were unmarried females. Among the 320-study population in this study, only 33 of them had known medical/menstrual problem and 3.8% were known case of polycystic ovarian syndrome and were on treatment on and off [Table 1].

Table 2 Menstrual and personal history of the participants

Age of menarche	**Number of participants**	**Percentage**
<12 years	50	15.6
12-13 years	168	52.5
14-15 years	99	30.9
>15 years	3	0.9
Duration of menstrual cycle		
15-20 days	35	10.9
21-28 days	190	59.3
29-35 days	90	28.1
>35 days	5	1.5
Number of days of menstruation		
<3 days	50	15.6
3-4 days	180	56.2

5-6 days	83	25.9
>6 days	7	2.1
Number of pads used per day		
<2	14	4.4
2-3	182	57.8
4-5	112	35.6
>5	7	2.2
Diet		
Vegeterian	89	27.6
Non vegeterian	11	3.5
Mixed	220	68.9
Addiction		
Yes	10	3.2
No	310	96.8
Sleep pattern		
Normal	110	34.3
>8 hours	123	38.4
<8hours	87	27.1

The menstrual history of the study population showed that 52.5% attained their menarche between 12-13years and 30.9% attained their menarche between 14-15years. In this study 59.3% had a normal duration of cycle that is 21-28days and 28.1% had cycle between 29- 35days. Around 56.2% had 3-4days of menses and 25.9% had 5-6days of menses while 57.8% used 2-3pads/day on an average and 35.6% used 4-5pads/day. The amount of bleeding could not be ascertained as usage of pads and its soakage were subjective varying between individual to individual.In this study population 68.9% consumed mixed diet and 96.8% did not have any addiction and among the 10 participants who had addiction 7 were addicted to smoking, 3 were to alcohol. Almost 34.3% of the participants had normal sleep hour that is 8hrs and 38.4% had sleep for more than 8hours. [Table 2]

Table 3 Characteristic of dysmenorrhea

Prevalence of primary dysmenorrhea	**Number of participants**	**Percentage**
Yes	133	41.5
no	187	58.5
Experience of pain due to menstruation		
First menstruation onward	84	26.5
Within a year after first menses	121	37.8
After 1 year	33	10.3
After 2 or more years	82	25.6
Days of menses with severe pain		
1 day before the onset of menses	154	48.1
On the first day	145	45.3
On the second day	18	5.6

On any other day	3	0.9
Total duration of pain per menstrual cycle		
<1 hour	73	22.8
1-4 hours	175	54.6
5-8 hours	64	20
>8 hours	8	2.5
Site of pain		
Lower abdomen	100	31.2
Lower abdomen and back	160	50
Lower abdomen, back and legs	60	18.7
Coping mechanism for the pain		
Exercise	31	9.8
Hot shower	62	19.7
Hot pack	16	5.1
Analgesics	107	33.4
Other	2	0.3
None	102	32
Consulted a gynaecologist		
Yes	33	10.3
No	287	89.7

In this study population 41.5% had associated abdominal pain, 37.8% had experienced pain within 1 year of menarche and 48.1% had severe dysmenorrhoea one day before the onset of menses whereas 45.3% had dysmenorrhoea on the first day of menses. Around 54.6% of participants had a total duration of pain of 1-4hours during the entire menstrual cycle and 50% had pain in the lower abdomen and back.In this study 9.8% used exercise, 19.7% used hot shower, 5.1% used hot pack, 33% used analgesics as a coping mechanism for dysmenorrhoea, 10.3% consulted a gynaecologist for the dysmenorrhoea and 89.7% did not consult as they were medical students and were aware of the condition [Table 3].

Table 4 Effects of dysmenorrhea and PMS on life and academics

Effects	**Number of participants**	**Percentage**
Absenteeism		
1 day	10	3.2
1-2 days	22	7.0
2-6 days	8	2.2
1 week	14	4.1
>1 week per year	28	8.9
No	238	74.6
Decreased academic performance	44	14.0
Lack of concentration	39	12.4
Social withdrawal	33	10.5

Effect on daily activities	30	9.5
Effect on sleep	40	12.7
Skipping meals during dysmenorrhea	30	9.5

In this study, 8.9% were absent from their academics for >1 week per year, 14% had decreased academic performance, 12.4% suffered from lack of concentration, 10.5% had social withdrawal and 9.5% skipped their meals due to dysmenorrhea. Dysmenorrhea affected daily activities of 9.5% of the study group while 12.7% had effect on their sleep patterns [Table 4].

Table 5 Significant effects of dysmenorrhea on life and academics of the participants (n=320)

Effects	**Dysmenorrhea present**	**Dysmenorrhea absent**	**P -value**
Absenteeism			<0.01
1-2 days	18(14.1%)	11(5.9%)	
2-6 days	67(4.7%)	5(2.1%)	
1 week	8(6.2%)	6(2.7%)	
>1 week per year	19(14.1%)	11(5.3%)	
No	78(60.9%)	157(84%)	
Effect on daily activities			0.001
Yes	22(16.5%)	11(5.9%)	
No	111(83.4%)	176(94.1%)	
Effect on sleep			<0.001
Yes	35(26.3%)	7(3.7%)	
No	98(73.6%)	180(96.3%)	
Decreased academic performance			<0.001
Yes	35(26.3%)	11(5.9%)	
No	98(73.6%)	176(94.1%)	
Lack of concentration			<0.001
Yes	34(25.5%)	10(5.3%)	
No	99(74.5%)	177(94.7%)	
Social withdrawal			<0.001
Yes	28(21%)	10(5.3%)	
No	105(78.9%)	177(94.7%)	

In this study, 14.1% had absenteeism from college/ work for 1-2days per year and 14.1% had absenteeism for >1 week which was significant with p-value <0.01.There is a positive correlation between dysmenorrhoea and effect on daily activities and sleep disturbance as the p value is 0.001. There is a positive correlation between the decrease in academic performance and the dysmenorrhoea as 26.3% had a decrease in the academic performance with p value <0.001.25.5% had a lack of concentration during dysmenorrhoea with p value of <0.001 having a positive correlation.21% had social withdrawal during the menses with p value <0.001 [Table 5].

Table 6 Prevalence PMS in the study group

Prevalence of PMS	Number of participants	Percentage
Yes	196	61
No	125	39

Table 7 Degree of PMS according to MDQ

Features	None	Mild	Moderate	Severe
NEGATIVE EFFECTS				
Crying	164(90.1%)	17(5.4%)	11(3.6%)	3(0.9%)
Anxiety	174(93.3%)	10(3.2%)	10(3.2%)	1(0.31%)
Irritability	170(92.06%)	15(4.5%)	8(2.5%)	2(0.63%)
Mood swings	167(91.1%)	7(2%)	19(6.03)	2(0.63%)
Depression	179(94.92%)	11(3.6%)	4(1.2%)	1(0.31%)
Tension	183(96.19%)	7(2.2%)	5(1.58%)	0
Restlessness	182(96%)	6(1.9%)	7(2.2%)	0
Loneliness	180(95.2%)	14(4.4%)	1(0.31%)	0
Tiredness	175(93.4%)	14(4.4%)	6(1.9%)	0
Concentration				
Lack of decisiveness	182(92.3%)	9(4.5%)	4(2%)	0
Confusion	186(94.9%)	6(3%)	2(0.63%)	1(0.31%)
Decreased efficiency	187(95.4%)	4(2%)	4(2%)	0
forgetfulness	193(98.4%)	2(0.63%)	0	0
Pain				
Abdominal pain	158(80.6%)	27(13.7%)	8(4%)	2(0.63%)
Cramps	172(87.7%)	10(5.1%)	11(5.6%)	2(0.63%)
Backache	178(90.8%)	8(4%)	6(3%)	3(1.5%)
Stiffness	189(96.4%)	6(3%)	0	0
Water retention				
Swelling	192(97.9%)	2(1.02%)	1(0.5%)	0
Weight gain	189(96.4%)	3(1.5%)	3(1.5%)	0
Breast pain	180(91.8%)	12(6.1%)	3(1.5%)	0
Behaviour change				
Performance	185(94.3%)	7(3.5%)	2(2%)	0
Take naps	184(93.8%)	5(2.5%)	4(2%)	1(0.5%)
Decreased social activities	193(98.46%)	9(4.5%)	2(1%)	0
Autonomic reactions				
dizziness	193(98.4%)	2(1%)	0	0

Sweats	188(95.9%)	4(2%)	2(1%)	1(0.5%)
Vomiting	192(97.5%)	2(1%)	1(0.5%)	0
Flushes	188(95.9%)	6(3%)	1(0.5%)	0
Insomnia	178 (90.8%)	9(4.5%)	8(4%)	0

The most common negative effects among this study population was crying (9.9%) which was followed by mood swings (8.9%) and least experienced effect was tension. Lack of decisiveness was the most common symptom in concentration features which was experienced by 6.5%. Abdominal pain was experienced by 19.4% and cramps were reported by 12.3%. Breast pain was experienced by 8.2% and insomnia was experienced by 9.2%. In total abdominal pain was the most experienced symptoms in PMS followed by cramps, crying, insomnia, mood swing [Table 6,7].

4. Discussion

Dysmenorrhea can affect various aspect of life including academic performance and mental health.The prevalence of primary dysmenorrhoea is 41.5% in this study participants which is close to a study done among medical students in Mangalore, Karnataka (45%) but was much less than the prevalence reported among medical students in the studies which was 80.7% and 70.2 % respectively [10, 11, 12]. The less prevalence may be due to the fact that this study also included post graduate (PG) medical students and senior residents (SR) who were more aware of dysmenorrhea and were adopting healthier life style.

In the present study, 37.8% had pain within 1 year of menarche and 48.1% had severe dysmenorrhoea one day before menses whereas 45.3% had dysmenorrhoea on the first day of menses. Around 54.6% of participants had a total duration of pain of 1-4hours during the entire menstrual cycle and 50% had pain in the lower abdomen and back. In a study conducted by Sima RM et al, 44% had dysmenorrhea from the first menstruation, 60.9% experienced it from the first day of menses, 95.2% reported that the pain was localized to the pelvis, lower abdomen. Pain radiated to the lumbar regions in 40.5% and 42.4% reported that pain persisted for almost a day[13]. In a study by Nayana most of the adolescent girl (46.6%) are having dysmenorrhoea from their first menstruation onward, 71(48.6%) experienced dysmenorrhoea for 1-4 hours and 66(45.2%) were having severe pain during their first day of menstruation and when considering the body parts having pain, most of them (36.3%) had back pain and lower abdominal pain.[14]

In this study 9.8% used exercise, 19.7% used hot shower, 5.1% used hot pack, and 33.4% used analgesics as a coping mechanism for dysmenorrhoea. A study conducted by Bilir et al reported the use of exercise (9.7%), hot shower (56.6%), hot packs (63.4%) and analgesic (92.6%) as the coping mechanisms [15].

In the present study, 8.9% consulted a gynaecologist for dysmenorrhoea and 91% did not consult as they were medical students and were aware of the condition themselves in contrast to a study by Mahwish where 66% of the students has consulted a doctor [3].

In this study group, 8.9% were absent from their academics for >1 week per year, 14% had decreased academic performance, 12.4% suffered from lack of concentration, 10.5% had social withdrawal and 9.5% skipped their meals due to dysmenorrhea. Dysmenorrhea affected daily activities of 9.5% of the study group while 12.7% had effect on their sleep patterns. In a study reported by Mahwish, 14.7% had restricted daily activities, 34.5% had negative impact on academic performance, 50% were absent from their academic sessions and 85.7% had lack of concentration[3].In a study done in Nigeria, dysmenorrhea affected routine work in 50.2%, 38.8% had sleep disturbance, 44.8% suffered from social withdrawal and 33.1% were absent from their academic lectures [16].In a study by Bilir the median school absenteeism due to dysmenorrhea was three days annually for 201 people [15].

In this study significant association was reported between dysmenorrhea and absenteeism, lack of concentration, sleep disturbance, social withdrawal and restricted daily activities. Similar was reported by Situmorang H where dysmenorrhea had significant association with disruption of concentration, activities and absenteeism [17].

The prevalence of premenstural symptoms in this study was 61% while that reported by Bilir was 71.3% alone and 65.9% along with dysmenorrhea [15]. In a study reported by Bhandari et al, the prevalence of PMS was 73.45% [18].

The most common negative effects among this study population were crying (9.9%) which was followed by mood swings (8.9%) and least experienced effect was tension. Lack of decisiveness was the most common symptom in

concentration features which was experienced by 6.5%. Abdominal pain was experienced by 19.4% followed by cramps (12.3%). Breast pain was experienced by 8.2% and insomnia was experienced by 9.2%. In total abdominal pain was the most experienced symptoms in PMS followed by cramps, crying, insomnia, mood swing.In a study conducted in Ghana, the most prevalent symptom was loss of appetite (67.3%) followed by fatigue(46.5%) and headache (42.6%) [19].In a study reported by Bhandari, the most common affective symptoms were irritability (98.79%), anger outburst (87.95%), anxiety (68.67%), depression (7.08), confusion (43.37%) and the most reported somatic symptoms were abdominal bloating (75.90%), breast tenderness (69.87%), joint or muscle pain (56.62%) [18].Bilir et al found that the most common symptoms in students with PMS was abdominal bloating (85.7%) and irritability (80.5%), breast tenderness (74.5%), angry outburst (72.5%), depression (56.2%), confusion (62.9%), social withdrawal (36.7%), headache (29.5%) and swelling of extremities (21.5%) [15].

5. Conclusion

Primary dysmenorrhea and premenstural symptoms are widely prevalent among the medical students yet unregarded as a medical complaint. It has a negative impact on the quality of life disrupting the daily activities, sleep pattern and social withdrawal. Also has a great impact on the academic life of the students resulting in absenteeism, lack of concentration and poor academic performance. Awareness should be created among the medical students about the impact on life and academic performance and should be encouraged to consult a specialist for timely diagnosis and intervention so as to reduce the impact of the disease on their, social, academic, physical and mental health.

Compliance with ethical standards

Statement of ethical approval

This study was conducted after obtaining approval from the Instituitional Ethics Committee.

Disclosure of conflict of interest

No conflict of interest.

Statement of informed consent

Informed consent was taken from all the participants of the study.

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