

Original Research Article

Prevalence of premenstrual syndrome and its impact on quality of life among female medical undergraduate students: a cross-sectional study

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ABSTRACT

Background: Premenstrual syndrome (PMS) encompasses a range of physical, emotional, and behavioural symptoms that occur cyclically during the luteal phase of the menstrual cycle. These symptoms, primarily influenced by hormonal fluctuations, can impair daily functioning and significantly reduce quality of life among female undergraduate students.

Methods: A cross-sectional study was conducted in December 2024 among 260 undergraduate female medical students. Participants were assessed using a structured, self-administered questionnaire that captured sociodemographic data, dietary habits, lifestyle factors, and symptom profiles. The Shortened Premenstrual Assessment Form was used to identify PMS, a symptoms checklist was used to assess premenstrual Dysphoric Disorder (PMDD), while quality of life was evaluated using the Symptom Checklist-36 (SCL-36). Statistical analysis was performed using descriptive statistics and chi-square tests; a p value <0.05 was considered significant.

Results: The prevalence of PMS was found to be 88.46% among the participants. The most frequently reported symptoms were backaches, joint and muscle aches and followed by abdominal heaviness and discomfort. Students with PMS demonstrated significantly lower quality of life across various domains. A strong association was observed between PMS and unhealthy dietary patterns, physical inactivity, and poor sleep hygiene.

Conclusions: A substantial proportion of medical students experienced distressing symptoms in the premenstrual phase, which adversely impacted their quality of life.

Keywords: Female students, Quality, Impacts, Premenstrual syndrome, Prevalence

INTRODUCTION

Premenstrual syndrome (PMS) is a cyclical disorder characterized by a variety of physical, emotional, and behavioural symptoms that occur during the luteal phase of the menstrual cycle and resolve soon after menstruation begins.¹ These symptoms, including irritability, mood swings, fatigue, and bloating, can vary in severity and significantly affect daily life.² While many women experience mild symptoms, a considerable proportion report moderate to severe premenstrual

syndrome that interferes with academic, social, and emotional functioning.³ The World Health Organization recognizes premenstrual syndrome as an important contributor to poor mental health and reduced quality of life in women of reproductive age.⁴

The prevalence of premenstrual syndrome among female medical undergraduates varies across regions due to differences in population characteristics, diagnostic criteria, and awareness levels. A recent study conducted at King Faisal University, Saudi Arabia, found a

premenstrual syndrome prevalence of 34.8% among female medical students, with common symptoms being irritability, anxiety, fatigue, and depressive mood.⁵ Another cross-sectional study from Bisha University, Saudi Arabia, reported a higher prevalence of 64.9% among female medical and applied science students, linking premenstrual syndrome to adverse academic and social outcomes.⁶ Similarly, a study in Ethiopia revealed significant premenstrual syndrome prevalence among female health science students, noting a strong association between premenstrual syndrome and absenteeism.⁷

Premenstrual syndrome can markedly impair the quality of life, leading to poor academic performance, social withdrawal, and emotional distress. Al-Shahrani et al highlighted that premenstrual syndrome negatively impacts satisfaction with academic life and social relationships among medical students.⁶ Additionally, a study in India by Bhuvaneswari et al emphasized the detrimental effect of premenstrual syndrome on the academic and social functioning of college students.⁸ These findings underscore the importance of early identification and support for affected students.

The main concern regarding premenstrual syndrome among female undergraduate students revolves around timely diagnosis and effective management, which are essential for maintaining academic performance and overall well-being. Despite growing global evidence, data on premenstrual syndrome among female medical students in India remain limited.

This study aims to assess the prevalence of premenstrual syndrome and to assess its impact on their quality of life among female medical undergraduates, aiming to inform institutional strategies for student well-being.

METHODS

Study design

This was a cross-sectional, online survey study conducted among female medical undergraduate students at Government Medical College, Nagpur.

Study population

The female medical undergraduate students aged 18 – 30 years were included.

Study duration

This study conducted for two months from December 2024 to January 2025.

Inclusion criteria

Female medical undergraduate students who gave consent were included.

Exclusion criteria

Females diagnosed with menstrual disorders, gynaecological disorders, chronic medical illnesses, existing psychiatric disorders, past history of urogenital surgeries, history of pregnancy, and females taking oral contraceptive pills.

Sample size and sampling technique

A proposed sample size of 260 participants was determined for this survey by using purposive sampling method. The sample size estimation was based on the statistical equation of cross-sectional surveys: initial sample size = $[(z^2 \cdot p \cdot q)]/d^2$, where p represents the prevalence of the premenstrual syndrome (76%), Z corresponds to a 95% confidence interval, d signifies an allowable error margin of no more than 5%.

Ethical approval

This cross-sectional study was initiated after obtaining permission from the Institutional Ethics Committee of host institution. Permission from the Dean of Medical College was obtained for the conduct of the study.

Data collection method

Data were collected via an online self-administered structured questionnaire prepared in English and distributed through social media platforms. The first part-questionnaire was designed to determine socio demographic profile of the students, details of the i.e. menstrual cycle and the lifestyle factors. The second part consisted of the shortened premenstrual assessment form (SPAF) which is a 10-item tool validated for the evaluation of premenstrual syndrome and the third part consisted of a quality-of-life assessment by using the Short Form 36 Health Survey (SF-36), which is reachable in the public domain. It has eight sections which includes vitality, physical functioning, bodily pain, general health perceptions, physical role functioning, emotional role functioning, social role functioning and mental health. The survey was administered via an online platform to enhance accessibility and participation.

Statistical analyses

The collected data was entered in Microsoft Excel sheet and analyzed using STATA14 software. The data analysis included descriptive statistics, such as frequencies and percentages, along with analytical statistical methods. Chi-square tests was done to analyse the data. A p value of less than 0.05 was considered statistically significant.

RESULTS

Table 1 summarizes the sociodemographic profile of the 260 female undergraduate medical students, premenstrual syndrome was found to be significantly associated with

dysmenorrhoea, a positive family history of premenstrual syndrome, lack of physical activity, and higher consumption of caffeine, salt, sweets, and junk food. While the majority of participants were aged 18-20 years and experienced menarche between 12 and 15 years, these factors did not show a significant link with premenstrual syndrome. Similarly, sleep duration was not significantly associated. Notably, caffeine and junk food

consumption were much higher among students with premenstrual syndrome (78.3% and 91.7%, respectively). Dysmenorrhoea was reported by 75.7% of those with premenstrual syndrome. These findings highlight the important role of menstrual and lifestyle factors in the prevalence of premenstrual syndrome among young female students.

Table 1: Sociodemographic and menstrual details and lifestyle factors of the study participants.

Characteristics	Total	Premenstrual	Syndrome (PMS)	P value
	(n=260)	Present (n=230) N (%)	Absent (n=30) N (%)	
Age in years				
18 - 20	252 (96.9)	217 (94.3)	30 (100.0)	0.497
21 - 25	8 (3.1)	13 (5.7)	0 (0.0)	
Age at menarche (years)				
<12	16 (6.2)	9 (3.9)	4 (13.3)	0.592
12-15	241 (92.7)	217 (94.3)	24 (80.0)	
>15	3 (1.1)	4 (1.7)	2 (6.7)	
Dysmenorrhoea				
Yes	151 (58.1)	174 (75.7)	9 (30.3)	<0.001
No	109 (41.9)	56 (24.3)	21 (70.0)	
Family history of PMS				
Yes	105 (40.4)	57 (24.8)	23 (76.7)	<0.001
No	152 (58.5)	173 (75.2)	7 (23.3)	
Physical activity				
Yes	108 (41.5)	57 (24.8)	23 (76.7)	<0.001
No	152 (58.5)	173 (75.2)	7 (23.3)	
Duration of sleep (hours)				
< 6	10 (3.8)	10 (4.3)	1 (3.3)	0.621
6 -10	247 (95.0)	217 (94.3)	28 (93.3)	
>10	3 (1.2)	3 (1.3)	1 (3.3)	
Caffeine consumption				
Yes	165 (65.0)	180 (78.3)	14 (46.7)	<0.001
No	91 (35.0)	50 (21.7)	16 (53.3)	
Amount of salt intake				
Normal	221 (85.0)	152 (66.1)	28 (93.3)	<0.001
Moderately	15 (5.8)	14 (6.1)	19 (3.3)	
High	24 (9.2)	64 (27.8)	1 (3.3)	
Consumption of sweets				
Yes	215 (82.7)	199 (86.5)	21 (70.0)	<0.003
No	45 (17.3)	31 (13.5)	9 (30.0)	
Consumptions of junk food				
Yes	211 (81.2)	211 (91.7)	12 (40.0)	<0.001
No	49 (18.8)	19 (8.3)	18 (60.0)	

Table 2 The most commonly reported premenstrual symptoms were backaches, joint and muscle aches (71.2%), abdominal discomfort (64.2%), feeling under stress (53.8%), and feeling sad or low (51.9%). Emotional symptoms such as irritability (48.1%) and feeling unable to cope (50%) were also frequently reported. Physical symptoms like bloating (41.9%), weight gain (31.2%), and breast tenderness (28.1%) were less common. These findings indicate that both physical and emotional symptoms are prevalent among students with

premenstrual syndrome, with pain-related and stress-related symptoms being the most dominant.

Table 3 Students present with premenstrual syndrome demonstrated significantly poorer quality of life compared to those without premenstrual syndrome across almost all domains, including physical functioning, emotional well-being, energy levels, and social functioning. The largest differences were seen in physical functioning and emotional health, where premenstrual

syndrome students had much lower scores. Although pain scores were lower in the premenstrual syndrome group, the difference was not statistically significant. These

results highlight the substantial negative impact of premenstrual syndrome on both physical and psychological aspects of daily life.

Table 2: Frequency of premenstrual symptoms (defined by a cut off of 4 on each item).

Symptom	Number (%)
Affective	
Feeling unable to cope	130 (50.0)
Feeling under stress	140 (53.8)
Irritability or bad temper	125 (48.1)
Feeling sad or blue	135 (51.9)
PAIN	
Breast tenderness	73 (28.1)
Backaches, joint and muscle aches	185 (71.2)
Abdominal heaviness/ discomfort	167 (64.2)
Weight gain	
Oedema/swelling	83 (31.9)
Feeling bloated	109 (41.9)

Table 3: Quality of life among participants with and without premenstrual syndrome (PMS).

Domain	Mean (Standard deviation)		P value
	With PMS (n = 230)	Without PMS (n= 30)	
Physical functioning	36.38 (18.90)	82.05 (23.81)	<0.001
Role barriers due to physical health	27.53 (24.87)	82.44 (26.41)	0.022
Role barriers due to emotional problems	32.28 (25.70)	81.55 (31.62)	<0.001
Energy/fatigue	22.77 (18.76)	72.99 (27.00)	<0.001
Emotional well being	27.51 (19.96)	76.93 (25.67)	<0.001
Social well being	37.89 (20.03)	85.56 (24.52)	0.002
Pain	34.63 (22.48)	79.61 (25.10)	0.102
General fitness	27.86 (17.18)	71.67 (23.89)	<0.001

DISCUSSION

The prevalence of PMS was 88.46% among female medical students. The estimate using the PMDD checklist in this group was 65.7%. This estimate of PMS/PMDD in our study is more than that in the study conducted among students (women) in a college of health sciences in Northern Ethiopia in which the prevalence was 37%, and in the study conducted among medical students in New Delhi, the prevalence of PMDD was 37%.^{9,10}

Our study being conducted in a women's college, the participants may have been more forthcoming and willing to discuss their symptoms. We also found that the prevalence estimate of PMDD was paradoxically higher than that of PMS itself. This may be due to the use of DSM-5 criteria as a checklist for PMDD which is not an appropriate use of the instrument. Hence, we have done further analysis of association for PMS alone and not for PMDD. The high degree of correlation between the number of items endorsed on the PMDD checklist with the SPAF scores provides an additional validator of the high frequency of PMS in the study population.

The frequency of musculoskeletal aches and pains among students with PMS was 71.3%, which closely aligns with findings from studies conducted in Thrissur (73%) and Peshawar (77.3%). The second most commonly reported symptom was abdominal heaviness, discomfort, and pain (64.3%), which is also comparable to the Peshawar study, where it was reported at 61.9%. Additionally, our study observed a significantly reduced quality of life among students with PMS. This finding is consistent with a study from Al Qassim University conducted among medical students, which also reported an association between PMS and physical complaints, low vitality, mental health issues, and body pain highlighting an overall decline in quality of life.⁸

Lifestyle factors such as physical activity, caffeine intake, and the consumption of sweets and junk food showed a significant association with PMS in our study. Similarly, Mishra et al. reported that lifestyle elements including sleep patterns, physical activity, and overall tea/coffee consumption were significantly linked to PMDD.¹⁰ A study from Egypt further supported these findings, revealing that 88.5% of students with PMS had a higher intake of sweet-tasting foods compared to 70.2% among

those who consumed less. Additionally, the study identified significant associations between PMS and the consumption of coffee and junk foods.¹¹ These findings collectively highlight that lifestyle factors play a crucial role in the occurrence of PMS and PMDD.

However, certain limitations should be acknowledged. Firstly, the study was conducted in a single tertiary care institution, which may limit the generalizability of the findings to other settings or student populations. Secondly, data were collected through a self-administered online questionnaire, which is subject to recall bias and social desirability bias.

The family history of PMS signs and symptoms was self-reported by the participants and this is liable to bias or error as we have no longer independently proven it. We have not used stringent strategies to measure excessive salt diet, physical activity and other life-style factors such as consumption of sweets or junk food and these are primarily based on self-reports of the participants.

CONCLUSION

In this cross-sectional study, we found a high prevalence of premenstrual syndrome (88.46%) among college students. The most common premenstrual symptoms were back aches, joint and muscle aches and next symptoms followed by abdominal discomfort, while the most frequent psycho-behavioural symptom is a loss of interest in daily activities. Severe premenstrual syndrome symptoms may negatively impact the academic and social performance of students, leading to frequent class absences, missed examinations, poor academic grades, and, in some cases, academic withdrawal. These effects not only influence the lives of the affected individuals but can also have broader implications for the country as a whole. Participants with PMS had poorer quality of life than those without premenstrual syndrome.

Recommendations

Educational institutions should raise awareness about premenstrual syndrome. Thus, interventions such as yoga and mind relaxing techniques should be adopted to improve the quality of life among young females who experience PMS. Regular screening and early identification using validated tools should be implemented. Counselling support must be made available for affected students.

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