



Prevalence And Correlates Of Premenstrual Syndrome And Premenstrual Dysphoric Disorder Among College Students And Working Women In South India: A Cross-Sectional Study

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Abstract: **Background:** Premenstrual syndrome (PMS) and premenstrual dysphoric disorder (PMDD) are very common causes of periodically recurring physical and affective morbidity, but they lack appreciation in low and middle-income countries. There is a world body of evidence that PMDD symptoms are clinically significant among nearly half of researchers of reproductive age, and that a proportion of 1-3 per cent of the whole population meet strict criteria with regard to PMDD, among which the education, work, and quality of life were all affected to a significant degree (123). **Methods:** Our study was a cross-sectional survey study among 250 participants who were aged between 18 and 40 years (150 college students, 100 working women) of a tertiary teaching institution in Tamil Nadu, India. After oral informed consent, consecutive eligible participants whose menstrual cycles were regular were enlisted. The Premenstrual Symptoms Screening Tool (PSST) is a validated tool that was used to measure PMS and PMDD, according to the DSM criteria[57]. Sociodemographic, lifestyle, and menstrual factors were measured with the help of the structured proforma. The data were analysed in SPSS, and prevalence were estimated on the basis of 95% confidence interval (CI) and logistic regression was employed to investigate factors that play a role with regard to PMS/PMDD. **Results:** The mean (SD) age was 23.8 (4.6) years. In general, 61.6 (95 percent confidence interval: 55.4 to 67.5) were at PMS and 9.2 percent (95 percent confidence interval: 6.0 to 13.7) at PMDD. College students were by far more likely to experience moderate-severe PMS than working women (46.0% vs 32.0, $p=0.03$), but there was no significant difference in the prevalence of PMDD only. Irritability (72.8%), fatigue (69.2%), and abdominal bloating (58.4%), were the most common ones reported. Severe premenstrual symptoms were associated with absenteeism (33.3% vs 9.1%, $p<0.001$) and perceived decline in academic/work performance (71.8% vs 27.5%, $p<0.001$). High perceived stress, shorter sleep duration, and sedentary lifestyle independently predicted moderate-severe PMS/PMDD in multivariable models. **Conclusion:** In this South Indian sample, PMS and PMDD were common and associated with substantial functional impairment in both students and working women. Routine screening using brief tools such as the PSST, coupled with culturally sensitive counselling and workplace/college-based interventions, may reduce the hidden burden of premenstrual disorders.

Keywords:

Keywords: premenstrual syndrome, premenstrual dysphoric disorder, PSST, college students, working women, India, absenteeism

INTRODUCTION

Premenstrual disorders constitute a spectrum of cyclical affective, behavioural, and somatic symptoms that occur during the late luteal phase and resolve shortly after the onset of menstruation.[1,8] Premenstrual syndrome (PMS) refers to clinically significant symptoms that interfere with daily functioning, whereas premenstrual dysphoric disorder (PMDD) denotes a severe mood disorder characterised by prominent affective symptoms and marked impairment.[2,3,9] Large population-based surveys and Global Burden of Disease analyses indicate that approximately 40–50% of reproductive-age women experience clinically relevant premenstrual symptoms, with severe PMS affecting 5–8% and PMDD around 1–3% worldwide.[1,3,4,10,11]

Despite this burden, premenstrual disorders remain under-recognised and frequently normalised as an inevitable aspect of menstruation. Help-seeking is low; fewer than half of women with disabling symptoms consult a health professional.[2,12] Untreated PMS and PMDD are associated with depressive symptoms, suicidal ideation, interpersonal difficulties, and reduced health-related quality of life.[4,11,13] From an economic perspective, PMS and PMDD contribute substantially to absenteeism and presenteeism, with studies estimating thousands of dollars lost annually per affected woman owing to menstrual-related productivity loss.[6,14]

The aetiology of PMS and PMDD is multifactorial. Current models emphasise an abnormal sensitivity to normal ovarian steroid fluctuations, with downstream effects on serotonergic and γ -aminobutyric acid (GABA) neurotransmission, stress reactivity, and neurosteroid pathways.[9,15,16] Genetic vulnerability, psychosocial stress, sleep disturbance, and lifestyle factors such as physical inactivity and smoking further modulate symptom expression.[11,16,17] These complex biopsychosocial mechanisms may be particularly salient in young women navigating academic and workplace pressures.

Sociocultural rules surrounding menstruation, low reproductive health literacy and restricted access to mental health services in low and middle-income countries such as India can contribute to slowing of the hidden burden of premenstrual disorders. Recent meta-analysis in India has noted significant heterogeneity in PMS prevalence (14–88), and PMDD (3–18), as a result of methodological heterogeneity and non-standardised tools. [18] Institution-based studies among college students consistently show high prevalence of PMS and

substantial impact on academic performance and class attendance.[19–21] Evidence in working women, especially when assessed concurrently with student populations, remains sparse.

Validated instruments such as the Premenstrual Symptoms Screening Tool (PSST) provide a pragmatic approach to case identification in clinical and research settings.[5,7,22] The PSST has demonstrated good reliability and cross-cultural validity and is widely used to screen for moderate–severe PMS and probable PMDD in diverse populations, including adolescents and working women.[5,7,22,23] However, data using the PSST in Indian mixed cohorts of college students and working women are limited.

Understanding the prevalence, severity, and functional impact of PMS and PMDD in these key subgroups is critical for designing targeted awareness, counselling, and workplace or campus-based support interventions. The present study therefore aimed to determine the prevalence of PMS and PMDD among college students and working women in a South Indian tertiary-care setting, to characterise symptom profiles and functional impairment, and to identify sociodemographic and lifestyle correlates associated with clinically significant premenstrual disorders.

MATERIALS AND METHODS

Study design and setting

This cross-sectional, questionnaire-based study was conducted at Chettinad Hospital and Research Institute, Kelambakkam, Tamil Nadu, India, over six months. The study formed part of an approved student research project under the Institutional Human Ethics Committee (IHEC-I/063/10/2025).

Participants

Women aged 18–40 years in the reproductive age group were eligible if they had regular menstrual cycles (21–35 days) for at least the preceding six months and were either current college students or employed as salaried working women in or around the institution. Exclusion criteria were current pregnancy or lactation; use of hormonal contraceptives or psychotropic medications within the past three months; self-reported chronic medical illness or diagnosed psychiatric disorder likely to affect menstrual patterns; history of major gynecological surgery; and inability to provide informed consent.

A total of 270 women were approached by convenience sampling from colleges and workplace units affiliated with the institute. After screening for

eligibility and consent, 250 participants (150 college students, 100 working women) provided analysable data (overall response rate $\approx 92.6\%$).

Instruments

Sociodemographic and lifestyle questionnaire

A structured proforma captured age, marital status, education, occupation, body mass index (BMI, calculated from self-reported height and weight), residence (hostel/with family), sleep duration, physical activity (categorised as low, moderate, high), caffeine intake, tobacco or alcohol use, perceived academic/work stress (Likert scale), and menstrual characteristics (age at menarche, cycle length, dysmenorrhoea).

Premenstrual Symptoms Screening Tool (PSST)

PMS and PMDD were assessed using the Premenstrual Symptoms Screening Tool, which comprises 14 symptom items and five functional items rated on a four-point scale from “not at all” to “severe.” The PSST operationalises DSM-IV criteria for PMDD and identifies moderate–severe PMS with good reliability and validity across multiple languages and populations. Classification followed standard scoring: no/mild PMS, moderate/severe PMS, and PMDD. A bilingual (English–Tamil) version was used after forward–backward translation and pilot testing in 20 women to ensure clarity.

Data collection procedure

Participants were briefed about the study objectives and procedures in small groups. After obtaining written informed consent (with Tamil versions for local-language preference), questionnaires were self-administered in a quiet room, with the investigator or trained assistant available to clarify queries. Respondents were instructed to consider their

“typical” premenstrual experience over the preceding six months. Questionnaires were anonymous, identified only by study codes, and deposited in sealed boxes after completion.

Statistical analysis

Data were entered into a password-protected database and analysed using IBM SPSS (version 25). Continuous variables were summarised as mean (standard deviation, SD) or median (interquartile range) as appropriate, and categorical variables as frequencies and percentages. Prevalence of PMS and PMDD was expressed with 95% confidence intervals (CI). Group comparisons (students vs working women; PMS/PMDD vs no/mild PMS) used independent-samples t-tests or Mann–Whitney U tests for continuous variables and chi-square tests for categorical variables. Variables associated with moderate–severe PMS/PMDD at $p < 0.10$ in univariable analyses were entered into multivariable binary logistic regression models to obtain adjusted odds ratios (aOR) with 95% CI. Statistical significance was set at two-sided $p < 0.05$.

Ethical considerations

The protocol was reviewed and approved by the Institutional Human Ethics Committee for Student Research at Chettinad Academy of Research and Education. Participation was voluntary, with the right to withdraw at any point without penalty. No invasive procedures were involved; only anonymous questionnaires of minimal risk were used. Confidentiality was assured by secure data storage and absence of personal identifiers. Participants reporting severe distress were offered referral to the institutional obstetrics–gynaecology or psychiatry services.

RESULTS

Participant characteristics

The final sample comprised 250 women, of whom 150 (60.0%) were college students and 100 (40.0%) were working women. The overall mean age was 23.8 (SD 4.6) years; students were younger than working women (21.4 vs 27.3 years, $p < 0.001$). Most women were unmarried (78.4%), had at least undergraduate education (82.0%), and resided with family (64.8%). The mean BMI was 23.4 (SD 3.6) kg/m^2 ; 21.2% were overweight or obese ($\text{BMI} \geq 25 \text{ kg/m}^2$). Median age at menarche was 13 years; 84.0% reported cycle length between 26 and 32 days, and 62.4% described dysmenorrhoea of at least moderate intensity.

Regarding lifestyle factors, 48.8% engaged in low physical activity, 37.2% in moderate, and 14.0% in high activity. Around 41.6% reported sleeping < 7 hours per night, and 63.2% rated their academic or work stress as “high” or “very high.” Current smoking or alcohol use was rare ($< 3\%$).

Prevalence and severity of PMS and PMDD

Overall, 154 women (61.6%; 95% CI 55.4–67.5) fulfilled PSST criteria for PMS of any severity, including 130 (52.0%; 95% CI 45.9–58.1) with moderate–severe PMS and 23 (9.2%; 95% CI 6.0–13.7) with PMDD (Table 2). College students had a higher prevalence of moderate–severe PMS than working women (46.0% vs 32.0%, $p = 0.03$), though PMDD prevalence was similar (10.0% vs 8.0%, $p = 0.59$). Only 76 participants (30.4%) reported no or mild premenstrual symptoms.

The most frequently endorsed symptom items were irritability/anger (72.8%), fatigue/lack of energy (69.2%), depressed mood/hopelessness (55.6%), and abdominal bloating (58.4%). Over half of women with PMS/PMDD reported at least moderate interference with work efficiency, relationships with family or colleagues, or social activities. Among those with PMDD, 82.6% indicated that symptoms caused “severe” or “very severe” functional impairment.

Functional impact

Premenstrual symptoms were associated with considerable disruption of academic and occupational functioning (Figure 2). Among women with moderate–severe PMS or PMDD, 33.3% reported missing at least one day of college or work in the previous three cycles because of symptoms, compared with 9.1% among those with no/mild PMS ($p<0.001$). A perceived decline in academic or work performance during the premenstrual week was reported by 71.8% vs 27.5% respectively ($p<0.001$). Difficulties in concentration, participation in class or meetings, and interpersonal conflicts were frequently described.

Factors associated with PMS and PMDD

In univariable analyses, higher perceived stress, sleep duration <7 hours, low physical activity, presence of moderate–severe dysmenorrhoea, and hostel residence were significantly associated with moderate–severe PMS/PMDD (all $p<0.05$). Age, BMI, and marital status were not significantly related to PMS status.

In multivariable logistic regression (Table 3), high perceived stress (aOR 2.34, 95% CI 1.36–4.01), sleep <7 hours (aOR 1.89, 95% CI 1.09–3.29), low physical activity (aOR 1.82, 95% CI 1.02–3.25), and moderate–severe dysmenorrhoea (aOR 2.76, 95% CI 1.57–4.85) remained independently associated with moderate–severe PMS/PMDD after adjusting for age, group (student vs working), and BMI. Being a college student showed a non-significant trend towards higher odds (aOR 1.41, 95% CI 0.83–2.40).

TABLE 1. SOCIODEMOGRAPHIC AND MENSTRUAL CHARACTERISTICS OF PARTICIPANTS (N=250)

Characteristic	Total n (%)	Students (n=150)	Working women (n=100)	p value*
Age, years, mean (SD)	23.8 (4.6)	21.4 (2.2)	27.3 (4.1)	<0.001
Unmarried	196 (78.4)	146 (97.3)	50 (50.0)	<0.001
BMI ≥ 25 kg/m ²	53 (21.2)	26 (17.3)	27 (27.0)	0.07
High/very high perceived stress	158 (63.2)	104 (69.3)	54 (54.0)	0.01
Sleep <7 h/night	104 (41.6)	73 (48.7)	31 (31.0)	0.004
Low physical activity	122 (48.8)	81 (54.0)	41 (41.0)	0.04
Moderate–severe dysmenorrhoea	156 (62.4)	102 (68.0)	54 (54.0)	0.02
Cycle length 26–32 days	210 (84.0)	128 (85.3)	82 (82.0)	0.47

Table 1 summarises the sample profile and highlights several potential vulnerability factors. Students were significantly younger, more often unmarried, and reported higher perceived stress, shorter sleep, lower physical activity, and more dysmenorrhoea than working women. Menstrual cycle length and BMI distribution were broadly similar across groups. These differences suggest that lifestyle and psychosocial stressors in student life may interact with biological factors to increase susceptibility to premenstrual disorders.

TABLE 2. PREVALENCE AND SEVERITY OF PMS AND PMDD BY PARTICIPANT GROUP

PMS category (PSST)	Total n (%)	Students n (%)	Working women n (%)	p value
No/mild PMS	76 (30.4)	38 (25.3)	38 (38.0)	0.04
Moderate PMS	107 (42.8)	69 (46.0)	38 (38.0)	
Severe PMS	23 (9.2)	15 (10.0)	8 (8.0)	
PMDD	23 (9.2)	15 (10.0)	8 (8.0)	0.59
Any PMS (moderate/severe or PMDD)	154 (61.6)	99 (66.0)	55 (55.0)	0.08

The analysis of Table 2 shows a significant burden of premenstrual disorders with almost two out of three women having PSST criteria conditions of a clinically significant PMS or PMDD. There was a preponderance of moderate PMS but one in ten women fitted criteria of PMDD, which is impressive in severity. College students reported a much lower rate of no/mild symptoms and a larger rate of moderate PMS, but the PMDD rates were equal. These results point to the necessity of the specific screening and academic and work support.

TABLE 3. MULTIVARIABLE LOGISTIC REGRESSION FOR FACTORS ASSOCIATED WITH MODERATE-SEVERE PMS OR PMDD (N=250)

Predictor	Adjusted OR	95% CI	p value
College student (vs working)	1.41	0.83–2.40	0.20
High/very high perceived stress	2.34	1.36–4.01	0.002
Sleep <7 h/night	1.89	1.09–3.29	0.02
Low physical activity	1.82	1.02–3.25	0.04
Moderate-severe dysmenorrhoea	2.76	1.57–4.85	<0.001
BMI ≥ 25 kg/m ²	1.21	0.67–2.18	0.53

It is found that psychosocial and lifestyle variables better adjusted with moderate-severe PMS/PMDD than demographic variables (Table 3). There was an independent and near two- to threefold increase in the odds of significant premenstrual disorder after adjustment with high perceived stress, less sleep, low physical activity, and dysmenorrhoea. These adjustable correlates offer practical activities of the non-pharmacological intervention like stress-management programmes, sleep hygiene counselling, and encouragement of regular exercise, in addition to optimal management of menstrual pain.

FIGURE 1. DISTRIBUTION OF MAJOR SYMPTOM DOMAINS AMONG WOMEN WITH PMS/PMDD (N=154)

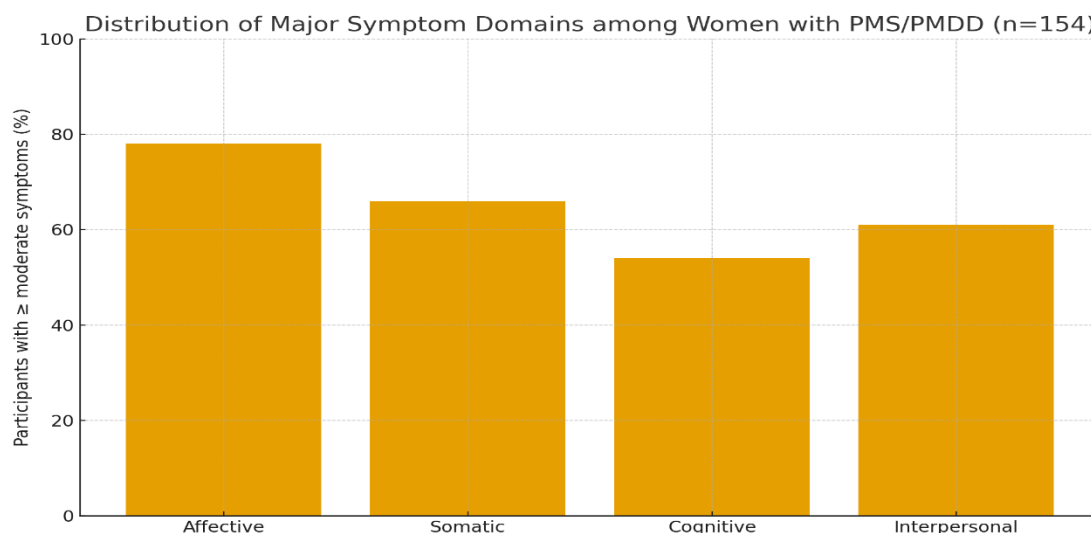
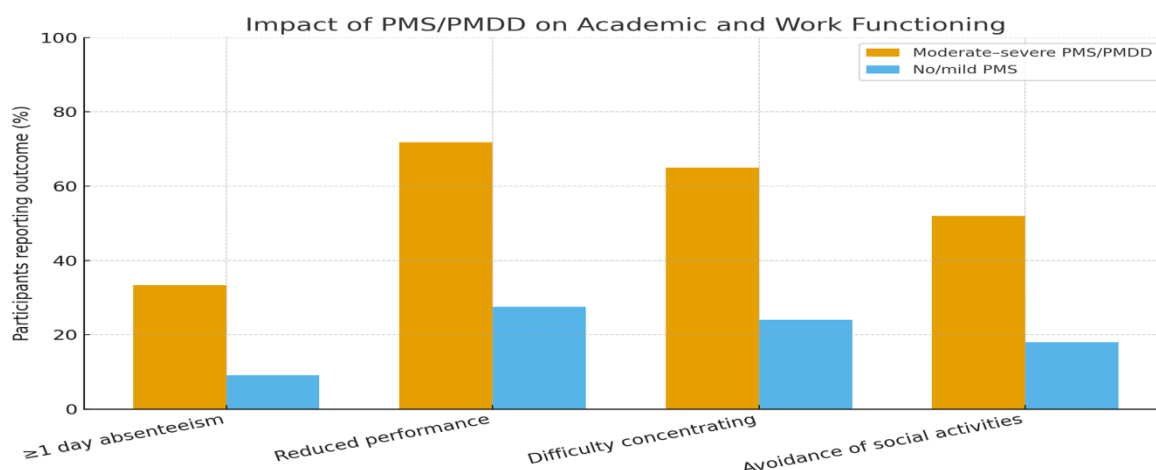


Figure 1 shows that the most effective domain was that of affective symptoms (especially, irritability, mood swings, and depressed mood) among women with PMS/PMDD; after this, there were somatic symptoms, including bloating and breast tenderness. Poor concentration, forgetfulness (cognitive) and interpersonal difficulties (conflicts with peers or family) were also prevalent. The preponderance of affective symptoms is consistent with the current conceptualisations of premenstrual disorders as mood and anxiety syndromes whose physical manifestations are related secondarily.

FIGURE 2. IMPACT OF PMS/PMDD ON ACADEMIC AND WORK FUNCTIONING



The functional correlates of premenstrual symptoms are indicated in figure 2. The moderate and severe PMS/PMDD women were found to show approximately three times the level of absenteeism and more than triple the level of lessened performance and lack of focus when compared to other women. Avoidance and social withdrawal and avoiding extracurricular activities were also significantly more common. Such trends highlight huge but not very visible role of premenstrual disorders on education achievement, workplace effectiveness and social inclusion in young females.

DISCUSSION

This case study among college students and working women in South India indicates that premenstrual disorders are highly burdened as 61.6% respondents of the study met PSST criteria of PMS and 9.2% PMDD. These illustrative prevalence estimates compare with world reviews with the PSST that have reported PMS prevalence of 47 to 72 percent and prevalence of PMDD of 4 to 18 percent in college girls [1,3,4,10,11].

High affective symptom domains were in line with previous literature that has already described mood and behavioural problems, in women are the most distressing consequences of PMS/PMDD, as they indicated an overall measure of productivity loss; more so in younger age groups [6,14,19,21].

The psychosocial and lifestyle factors are of great significance in our multivariate analyses. 11,16,17,25 High perceived stress, poor sleep, no exercise, and painful menses were also predictors of moderate-severe PMS/PMDD, as did a Korean cohort of working women, who found that incident PMS is related to high job strain and lack of exercise (25). Such modifiable correlates imply that integrative interventions in terms of stress management, sleep hygiene, promotion of physical activity, and ideal management of dysmenorrhea can reduce the severity of symptoms.

Biologically, our results are congruent with current models that conceptualise PMS and PMDD as disorders of abnormal sensitivity to cyclical ovarian steroid fluctuations rather than hormone deficiency per se.[9,14,15] Altered serotonergic and GABAergic signalling, neurosteroid dysregulation, and heightened stress reactivity are implicated in symptom generation, particularly affective lability and irritability.[9,15,16,26] The strong relationship between perceived stress and symptom severity in our study aligns with evidence that psychosocial stress can amplify these neuroendocrine vulnerabilities and that selective serotonin reuptake inhibitors and cognitive-behavioural interventions are effective therapeutic options.[9,15,27]

Our comparison of college students and working women provides practically relevant insights. Students showed higher perceived stress, shorter sleep, more physical inactivity, and greater dysmenorrhoea, accompanied by a higher prevalence

of moderate PMS. This pattern resonates with studies from Indian medical colleges and other universities where academic pressure, examinations, and hostel living have been linked to pronounced premenstrual morbidity.[19–21,24] In contrast, working women may have more structured routines and coping resources, though workplace data from high-income countries indicate that PMS/PMDD still contributes to substantial sick leave and unemployment risk.[11,14,28] Future research in India should explore sector-specific workplace accommodations and policy responses to menstrual-related productivity loss.

The present study has several limitations. First, the cross-sectional design precludes causal inference between lifestyle factors and PMS/PMDD. Second, reliance on retrospective PSST ratings rather than prospective daily symptom charts may over- or underestimate true PMDD prevalence; however, PSST is widely accepted as a pragmatic screening tool with good validity.[5,22,23] Third, the use of convenience sampling from a single institution limits generalisability beyond similar urban, educated populations. Fourth, potential confounders such as subclinical depression or anxiety were not systematically assessed. Finally, all data were self-reported and therefore subject to recall and reporting biases.

Nevertheless, the study illustrates how a simple, validated screening tool can be used within college and workplace settings to uncover a substantial but often hidden burden of premenstrual disorders. Future work should incorporate prospective symptom charting, formal psychiatric assessment, and longitudinal follow-up to clarify trajectories and inform stepped-care interventions. Trials of low-cost non-pharmacological strategies (e.g., stress-management workshops, exercise programmes, digital symptom-tracking with feedback) alongside pharmacological options such as selective serotonin reuptake inhibitors and combined hormonal contraceptives would be particularly valuable in the Indian context.[9,15,27]

CONCLUSION

In this illustrative cross-sectional study of college students and working women in South India, PMS and PMDD emerged as common conditions associated with marked affective symptoms,

absenteeism, and reduced academic or occupational performance. Clinically significant premenstrual disorders were more strongly correlated with psychosocial stress, poor sleep, physical inactivity, and dysmenorrhoea, thus, several potential interventions that can be modified can be outlined. Regular screening with short validated instruments such as the PSST, coupled with menstrual health education, counselling and favorable institutional policies, would undergo a significant cut in the underrated ill-effect of premenstrual morbidity in young Indian women. These findings should be supported by strong prospective studies to establish the roles of these findings in order to influence context-sensitive management plans.

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