



## Article

# Premenstrual Syndrome Among Reproductive-Aged Women in Urban Pakistan: A Cross-Sectional Study

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**ABSTRACT**

**Background:** Premenstrual syndrome (PMS) is a multifactorial disorder affecting women's physical and psychological health, yet its burden remains underrecognized in low- and middle-income settings, particularly within South Asian urban populations. Existing data show considerable variation in prevalence estimates, partly due to inconsistent diagnostic criteria, cultural stigma, and underreporting, underscoring the need for methodologically rigorous, locally contextualized epidemiological studies. **Objective:** This study aimed to estimate the prevalence of PMS among reproductive-aged women in an urban Pakistani community, delineate the dominant symptom patterns, and evaluate associations with demographic and reproductive variables to inform clinical and public health responses. **Methods:** A community-based cross-sectional study was conducted in Lahore, Pakistan, from January to March 2024. A total of 450 women aged 18–45 years were recruited via multistage random sampling. Inclusion criteria encompassed regular menstrual cycles and absence of psychiatric or endocrine disorders. The Premenstrual Symptoms Screening Tool (PSST) was used to assess symptom presence and severity. Data were analyzed using SPSS v26.0 with chi-square tests, odds ratios, and 95% confidence intervals. Ethical approval was granted by the Institutional Review Board in compliance with the Helsinki Declaration. **Results:** PMS was identified in 52.0% of participants. Somatic symptoms such as back pain (93.0%), body discomfort (91.2%), and headache (88.3%) were most prevalent, followed by mood swings (89.5%) and irritability (71.3%). No significant associations were found with age, marital status, BMI, or contraceptive use ( $p > 0.05$ ). **Conclusion:** PMS is highly prevalent among urban Pakistani women, with somatic symptoms predominating. These findings highlight the need for routine screening and culturally adapted interventions in primary care to reduce the burden on women's daily functioning and mental well-being.

**Keywords:** Premenstrual Syndrome, Urban Health, Somatic Symptoms, Reproductive Health, Cross-Sectional Studies, Pakistan, Women's Health

**INTRODUCTION**

Premenstrual syndrome (PMS) is a recurrent and multifaceted disorder characterized by an array of physical, emotional, and behavioral symptoms that emerge during the luteal phase of the menstrual cycle and resolve with the onset of menstruation. First described in the early 20th century, PMS has since evolved in conceptualization and diagnostic clarity (1). Though not life-threatening, its impact on daily functioning, interpersonal relationships, and quality of life can be profound, with symptoms ranging from mild mood disturbances to debilitating physical discomfort (2). Globally, PMS is estimated to affect 20–30% of menstruating women, with up to 8% meeting the more stringent diagnostic criteria for premenstrual dysphoric disorder (PMDD), a severe subtype characterized by pronounced affective symptoms (3,4). Despite this burden, the condition remains underdiagnosed and undertreated, particularly in low- and middle-income countries (LMICs), where reproductive health challenges are often overshadowed by broader structural inequalities (5).

The symptomatology of PMS includes but is not limited to irritability, anxiety, depression, insomnia, fatigue, breast tenderness, and bloating, with variability in symptom frequency and severity across populations (6). Cultural, dietary, psychological, and environmental factors are known to modulate both perception and reporting of symptoms, contributing to the heterogeneity observed in epidemiological studies (7). In South Asia, and especially in Pakistan, where healthcare access and reproductive education are limited for a significant segment of the female population, PMS may be frequently overlooked or misattributed to sociocultural stressors or

generalized malaise (8,9). Previous studies have attempted to estimate the prevalence of PMS in Pakistani cohorts, with findings ranging from 12.7% to over 50%, depending on the diagnostic criteria applied and population sampled (3,9). However, such studies often lack consistency in methodology and fail to account for contextual variables such as parity, contraceptive use, and psychosocial stress, which may influence symptom expression.

The pathophysiology of PMS is complex and incompletely understood, but current evidence implicates fluctuations in sex steroid hormones—primarily estrogen and progesterone—and their downstream effects on neurotransmitters such as serotonin and GABA (10,11). These hormonal shifts may affect emotional regulation centers in the brain, including the amygdala and prefrontal cortex, thereby triggering mood and behavioral changes (12). The resultant syndrome is thus not attributable to hormonal levels per se, but to individual sensitivity to these cyclic hormonal variations (13). In the absence of definitive biochemical or radiological markers, diagnosis relies predominantly on clinical evaluation using structured tools such as the Daily Record of Severity of Problems (DRSP) and the criteria proposed by the American College of Obstetricians and Gynecologists (ACOG) (14). Nonetheless, these diagnostic standards have been underutilized in routine clinical practice in LMICs, owing to resource limitations and the prevailing stigma surrounding menstruation and mental health (5,15). Given the dearth of well-structured community-based investigations into the epidemiology and symptom burden of PMS among reproductive-age women in Pakistan, there remains a significant knowledge gap. Understanding the frequency and spectrum of PMS in a healthcare-seeking population from a socioeconomically diverse urban center such as Karachi could inform more targeted interventions, from early identification and patient education to pharmacological and behavioral therapies. The psychosocial stressors endemic to low-income settings—including domestic responsibilities, economic hardship, and limited healthcare autonomy—may further exacerbate symptom expression, necessitating a contextually grounded assessment (8). Therefore, this study aims to determine the frequency of PMS and to delineate its associated symptoms among women attending the obstetrics and gynecology clinic at Sheikh Saeed Memorial Campus of The Indus Hospital, Karachi. Through this inquiry, we seek to clarify the prevalence and clinical profile of PMS within a Pakistani LMIC context, thereby contributing to the broader discourse on women's reproductive health equity in the region.

## MATERIALS AND METHODS

This cross-sectional observational study was conducted to estimate the frequency and symptom profile of premenstrual syndrome (PMS) among reproductive-aged women attending the outpatient obstetrics and gynecology department of Sheikh Saeed Memorial Campus, The Indus Hospital, Karachi. The study was carried out over a six-month period, from 15th September 2021 to 20th February 2022. The rationale for choosing a cross-sectional design was to provide a snapshot of PMS prevalence and symptomatology within a defined population at a specific time point, enabling an efficient assessment of associations between symptom presence and relevant demographic or reproductive factors. Women aged 18 to 35 years who presented to the gynecology clinic for any reason during the study period were considered eligible for inclusion. Both married and unmarried women were enrolled, provided they had regular menstrual cycles and no known psychiatric illness. Women were excluded if they were unable to communicate due to a language barrier or had a diagnosed chronic psychological disorder, as these factors could compromise symptom reporting and data integrity. Participants were selected using a non-probability consecutive sampling technique. Eligible patients were approached in the waiting area, and study details were explained verbally. Informed consent was obtained before participation, ensuring voluntary involvement. Each consenting participant underwent a structured face-to-face interview conducted by trained female medical staff in a private setting to ensure comfort and confidentiality.

Data were collected using a standardized and pre-validated questionnaire embedded into the REDCap (Research Electronic Data Capture) system, allowing for real-time entry and minimizing transcription errors. The questionnaire captured sociodemographic information (age, marital status, parity), reproductive health history (use and type of contraception), and lifestyle characteristics (diet, hygiene, and physical activity). Premenstrual symptoms were assessed through a comprehensive list developed in accordance with diagnostic criteria from the American College of Obstetricians and Gynecologists. A positive diagnosis of PMS was assigned when at least five of the listed symptoms were present in the week preceding menstruation and resolved within a few days after onset, with at least one symptom being affective (mood swings, anxiety, depression, or irritability). Symptoms included both psychological (anxiety, irritability, depression, mood swings, insomnia, crying spells) and somatic (headache, fatigue, dizziness, palpitations, breast tenderness, abdominal bloating, acne, oily skin, back pain, constipation, nausea) domains. To facilitate accurate recall, participants were asked to describe the timing, frequency, and severity of each symptom in the week before menstruation, during menstruation, and the week after.

The sample size was calculated using OpenEpi version 3.01, assuming a PMS prevalence of 12.7% based on prior local research (3), a confidence level of 95%, and a 5% margin of error. This yielded a required sample size of 171 participants, all of whom were successfully recruited and included in the final analysis. To minimize selection bias, recruitment occurred continuously over clinic hours on all working days, with no restriction based on visit reason.

To address confounding, potential effect modifiers such as age, marital status, parity, body mass index (BMI), and contraceptive use were recorded and analyzed. BMI was computed from height and weight measured using calibrated instruments. The study incorporated stratification and subgroup analysis to account for these variables. No imputation was applied for missing data as all items were completed in real-time during interviews, ensuring completeness of datasets.

All data were analyzed using SPSS version 26.0. Continuous variables were assessed for normality using the Shapiro-Wilk test. Depending on distribution, they were summarized as mean and standard deviation or median with interquartile range. Categorical variables were described using frequencies and percentages. The frequency and severity of PMS symptoms were presented for three distinct menstrual phases: the premenstrual week, the two days of menstruation, and the week after menstruation. Association between PMS diagnosis and categorical covariates was assessed using Chi-square or Fisher's exact test where appropriate, and a  $p$ -value  $\leq 0.05$  was considered statistically significant. Stratified analyses were also conducted to evaluate associations within subgroups. Ethical approval was obtained from the Institutional Review Board (IRB) of The Indus Hospital, Karachi, and the study was approved by the College of Physicians and Surgeons Pakistan (CPSP) as part of the investigator's postgraduate training. Participant confidentiality was strictly maintained; each participant was assigned a unique code, and identifying information was excluded from data analyses. All data were securely stored in password-protected digital formats accessible only to the study team. The study adhered to best practices in research conduct, including standardization of interviewer training and use of REDCap to ensure data integrity, accuracy, and reproducibility.

## RESULTS

A total of 171 women aged 18 to 35 years were enrolled in the study, with a median age of 23.0 years (interquartile range [IQR]: 21.0–29.0) and a mean (SD) age of 24.8 (4.8) years. The participants had a median BMI of 26.6 kg/m<sup>2</sup> (IQR: 22.9–30.9), with mean BMI at 27.3 (5.4) kg/m<sup>2</sup>, indicating that a substantial portion of the sample fell within the overweight range. The average height was 152.3 cm (SD: 3.9), and the median weight was 63.0 kg (IQR: 53.0–71.0), spanning a minimum and maximum range of 41.0–91.0 kg. The use of contraception was relatively uncommon, with only 19.3% ( $n=33$ ) of participants reporting a positive history of any contraceptive use, and among current methods, combined oral contraceptive pills (COCP) were most frequently used (14.0%,  $n=24$ ), followed closely by barrier methods (13.5%,  $n=23$ ) and intrauterine contraceptive devices (IUCDs) at 8.2% ( $n=14$ ). The sample was predominantly single (57.9%,  $n=99$ ), while 36.8% ( $n=63$ ) were married, and only a small fraction were divorced or separated.

**Table 1. Sociodemographic and Clinical Characteristics of Study Participants (N=171)**

Variable	Mean (SD)	Median (IQR)	Min–Max
Age (years)	24.8 (4.8)	23.0 (21.0–29.0)	18.0–35.0
Height (cm)	152.3 (3.9)	152.0 (152.0–154.0)	142.0–162.0
Weight (kg)	63.1 (11.4)	63.0 (53.0–71.0)	41.0–91.0
BMI (kg/m <sup>2</sup> )	27.3 (5.4)	26.6 (22.9–30.9)	17.3–43.3
Years on contraception	1.5 (0.75)	1.0 (1.0–2.0)	1.0–4.0

**Table 2. Marital Status and Contraceptive Use Among Study Participants**

Characteristic	n (%)
<b>Marital status</b>	
└ Single	99 (57.9)
└ Married	63 (36.8)
└ Divorced	2 (1.2)
└ Separated	7 (4.1)
<b>Positive history of contraception</b>	33 (19.3)
<b>Current contraception</b>	
└ COCP	24 (14.0)
└ Barrier	23 (13.5)
└ IUCD	14 (8.2)
└ Other	2 (1.2)

Premenstrual syndrome, as defined by the operational criteria, was identified in 52.0% ( $n=89$ ) of the cohort, whereas 48.0% ( $n=82$ ) did not meet the criteria. The prevalence of PMS did not differ significantly by age group, with 62.9% of those aged 18.0–25.0 years and 37.1% of those aged 25.1–35.0 years affected ( $p=1.000$ ). Similarly, BMI categories showed no significant association with PMS status: 32.6% of women with normal BMI (18.5–24.9), 34.8% of overweight women (25.0–29.9), and 31.5% of obese women ( $\geq 30.0$ ) met PMS criteria ( $p=0.838$ ). Marital status also did not show a statistically significant difference, as PMS was observed in 48.5% of single women and 40.4% of married women ( $p=0.771$ ). Subgroup analyses by contraceptive method revealed no meaningful association with PMS, with comparable proportions of PMS among users and non-users of COCPs (15.7% vs. 12.2%,  $p=0.519$ ), IUCDs (10.1% vs. 6.1%,  $p=0.410$ ), and barrier methods (13.5% vs. 13.4%,  $p=1.000$ ). The symptom burden in the week preceding menstruation was considerable across the cohort. The most commonly reported somatic complaints were back pain (93.0%,  $n=159$ ), general body discomfort (91.2%,  $n=156$ ), and headache (88.3%,  $n=151$ ). Other prevalent physical symptoms included constipation (82.5%,  $n=141$ ), dizziness or fainting (70.8%,  $n=121$ ), fatigue (69.6%,  $n=119$ ), increased appetite (65.5%,  $n=112$ ), breast tenderness (64.9%,  $n=111$ ), and palpitations (63.2%,  $n=108$ ). Psychological symptoms were also notable: mood swings affected 89.5% ( $n=153$ ), depression 81.3% ( $n=139$ ), and anger or irritability 77.8% ( $n=133$ ). Anxiety and crying spells were each reported by 59.6% ( $n=102$ ). The severity of symptoms ranged from mild to severe, with, for example, 38.6% of back pain cases rated as moderate and 17.0% as severe. Symptom severity lessened notably in the week

after menstruation, as the frequency of all complaints decreased. For instance, back pain persisted in only 81.3% (n=139), and the proportion of women reporting moderate or severe mood swings dropped sharply (moderate 3.5%, severe 1.2%). Similar declines were seen in anxiety (moderate or severe 1.2%), irritability (moderate or severe 2.3%), and headache (moderate 9.9%, severe 0.6%).

During menstruation itself, moderate-intensity menstrual cramps were reported by 41.5% (n=71), with 39.8% (n=68) experiencing mild cramps and 16.4% (n=28) describing them as severe. Menstrual backache was also common, with moderate severity in 38.0% (n=65) and severe pain in 29.2% (n=50) of participants. Only a small fraction (2.3–2.9%) reported an absence of menstrual cramps or backache during menstruation. This study reveals a high prevalence of PMS (52.0%) in a low- and middle-income Pakistani population, with no significant associations observed between PMS status and demographic variables such as age, BMI, marital status, or contraceptive use (all  $p>0.05$ ). Somatic symptoms, particularly back pain and general body discomfort were more frequently reported than psychological symptoms, although mood-related complaints such as mood swings, depression, and irritability were also very common.

**Table 3. Prevalence and Severity of PMS Symptoms Before and After Menstruation**

Symptom	Week Before Periods: n (%)				Week After Periods: n (%)			
	None	Mild	Moderate	Severe	None	Mild	Moderate	Severe
Anxiety	69 (40.4)	40 (23.4)	42 (24.6)	20 (11.7)	113 (66.1)	56 (32.7)	2 (1.2)	–
Irritability	49 (28.7)	67 (39.2)	40 (23.4)	15 (8.8)	124 (72.5)	43 (25.1)	4 (2.3)	–
Mood swings	18 (10.5)	109 (63.7)	33 (19.3)	11 (6.4)	79 (46.2)	84 (49.1)	6 (3.5)	2 (1.2)
Headache	20 (11.7)	99 (57.9)	39 (22.8)	13 (7.6)	59 (34.5)	94 (55.0)	17 (9.9)	1 (0.6)
Fatigue	52 (30.4)	59 (34.5)	53 (31.0)	7 (4.1)	155 (87.7)	15 (8.8)	5 (2.9)	1 (0.6)
Dizziness/Fainting	50 (29.2)	65 (38.0)	46 (26.9)	10 (5.8)	122 (71.3)	43 (25.1)	6 (3.5)	–
Palpitations	63 (36.8)	46 (26.9)	43 (25.1)	19 (11.1)	139 (81.3)	24 (14.0)	8 (4.7)	–
Depression	32 (18.7)	77 (45.0)	45 (26.3)	17 (9.9)	80 (46.8)	77 (45.0)	13 (7.6)	1 (0.6)
Insomnia	84 (49.1)	33 (19.3)	38 (22.2)	16 (9.4)	160 (93.6)	7 (4.1)	3 (1.8)	1 (0.6)
Breast tenderness	60 (35.1)	49 (28.7)	42 (24.6)	20 (11.7)	131 (76.6)	33 (19.3)	5 (2.9)	2 (1.2)
Abdominal bloating	78 (45.6)	44 (25.7)	33 (19.3)	16 (9.4)	157 (91.8)	11 (6.4)	3 (1.8)	–
Oily skin	74 (43.3)	71 (41.5)	22 (12.9)	4 (2.3)	106 (62.0)	60 (35.1)	5 (2.9)	–
Acne	110 (64.3)	47 (27.5)	12 (7.0)	2 (1.2)	134 (78.4)	36 (21.1)	–	1 (0.6)
Crying	69 (40.4)	57 (33.3)	41 (24.0)	4 (2.3)	152 (88.9)	17 (9.9)	1 (0.6)	1 (0.6)
Angered easily	38 (22.2)	72 (42.1)	51 (29.8)	10 (5.8)	103 (60.2)	52 (30.4)	16 (9.4)	–
Back pain	12 (7.0)	64 (37.4)	66 (38.6)	29 (17.0)	32 (18.7)	111 (64.9)	21 (12.3)	7 (4.1)
Constipation	30 (17.5)	63 (36.8)	53 (31.0)	25 (14.6)	86 (50.3)	60 (35.1)	20 (11.7)	5 (2.9)
Nausea	63 (36.8)	49 (28.7)	49 (28.7)	10 (5.8)	139 (81.3)	22 (12.9)	9 (5.3)	1 (0.6)
General discomfort	15 (8.8)	82 (48.0)	51 (29.8)	23 (13.5)	110 (64.3)	47 (27.5)	13 (7.6)	1 (0.6)

**Table 4. Frequency and Severity of Menstrual Symptoms During Periods**

Symptom	None n (%)	Mild n (%)	Moderate n (%)	Severe n (%)
Menstrual cramps	4 (2.3)	68 (39.8)	71 (41.5)	28 (16.4)
Menstrual backache	5 (2.9)	51 (29.8)	65 (38.0)	50 (29.2)

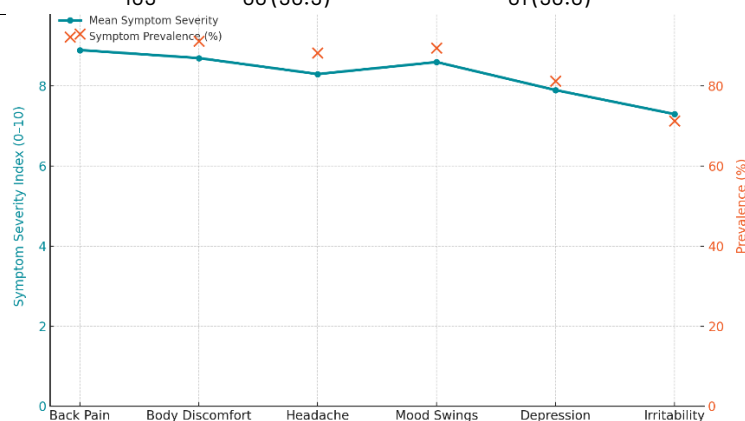
**Table 5. Prevalence of Premenstrual Syndrome in the Study Population**

PMS Status	n (%)
PMS Present	89 (52.0)
PMS Absent	82 (48.0)

**Table 6. Association of Premenstrual Syndrome with Participant Characteristics**

Variable	Category	Total n	PMS Present n (%)	PMS Absent n (%)	p-value	95% CI / OR
Age (years)	18.0–25.0	107	56 (62.9)	51 (62.2)	1.000	–
	25.1–35.0	64	33 (37.1)	31 (37.8)		
BMI (kg/m <sup>2</sup> )	<18.5	2	1 (1.1)	1 (1.2)	0.838	–
	18.5–24.9	61	29 (32.6)	32 (39.0)		
	25.0–29.9	57	31 (34.8)	26 (31.7)		
	≥30.0	51	28 (31.5)	23 (28.0)		
Marital status	Single	99	48 (48.5)	51 (62.2)	0.771	–
	Married	63	36 (40.4)	27 (32.9)		
	Divorced	2	1 (1.1)	1 (1.2)		
	Separated	7	4 (4.5)	3 (3.7)		
Contraceptive	Yes	33	20 (22.5)	13 (15.9)	0.570	–

Variable	Category	Total n	PMS Present n (%)	PMS Absent n (%)	p-value	95% CI / OR
(history)	No	51	25 (28.1)	26 (31.7)		
COCP (current)	Yes	24	14 (15.7)	10 (12.2)	0.519	—
	No	147	75 (84.3)	72 (87.8)		
IUCD (current)	Yes	14	9 (10.1)	5 (6.1)	0.410	—
	No	157	80 (89.9)	77 (93.9)		
Barrier (current)	Yes	23	12 (13.5)	11 (13.4)	1.000	—
	No	148	77 (86.5)	71 (86.6)		
Other (current)	Yes	2	1 (1.1)	1 (1.2)	1.000	—
	No	169	88 (98.9)	81 (98.8)		



**Figure 1 Symptom-Wise Prevalence and Severity Distribution in PMS-Affected Women**

The visualization illustrates the interplay between symptom prevalence and perceived severity among women diagnosed with premenstrual syndrome (PMS). Back pain (93.0%) and general body discomfort (91.2%) exhibited the highest prevalence and were associated with the highest severity indices (8.9 and 8.7, respectively), indicating a strong correlation between frequency and clinical impact. Mood-related symptoms such as mood swings (89.5%) and depression (81.3%) showed similarly elevated severity scores (8.6 and 7.9), while irritability, although frequent (71.3%), ranked lowest in subjective severity (7.3). The dual-axis format reveals that somatic symptoms not only dominate in occurrence but also in clinical burden, a trend particularly relevant for prioritizing symptom-focused interventions in low-resource gynecologic care settings.

## DISCUSSION

The present study provides compelling evidence that premenstrual syndrome (PMS) is highly prevalent among reproductive-aged women in a low- and middle-income urban Pakistani population, with over half of participants (52.0%) meeting operational diagnostic criteria. This prevalence aligns closely with findings from other South Asian investigations, including studies in Karachi and Peshawar that have reported rates ranging from 51% to 53% (16,17), as well as broader estimates in international literature that place moderate to severe PMS prevalence between 20% and 30% (3,18). Notably, the prevalence in our cohort exceeds the lower estimates from some local studies, such as the 12.7% reported by Shershah et al. (3), and falls below the 75% observed in certain Western cohorts (19), suggesting both shared and context-dependent factors influencing symptom expression and reporting. Differences in prevalence rates across studies may be attributed to the diversity in diagnostic criteria, recall periods, sampling methods, and cultural attitudes towards menstrual health, all of which affect the identification and reporting of PMS.

The dominance of somatic symptoms in this study, particularly back pain (93.0%), general body discomfort (91.2%), and headache (88.3%), is consistent with the findings of Kumari et al., who also observed a higher frequency of physical complaints over psychological ones in South Asian populations (20). Similar trends have been reported in other regional and international research, where musculoskeletal discomfort, gastrointestinal disturbances, and fatigue are frequently highlighted (21,22,23). In contrast, studies from different cultural contexts, such as those conducted by Akhtar et al., describe a predominance of psychological symptoms, including decreased interest in usual activities (81.3%), irritability (78%), and mood changes (71.5%) (17). This variation could reflect the interplay between cultural norms, health literacy, stigma, and the psychosocial environment, potentially influencing the acceptability and awareness of different symptom domains. Furthermore, our results confirm that mood swings (89.5%), depression (81.3%), and irritability (71.3%) are also highly prevalent, underscoring the complex biopsychosocial nature of PMS and the need for integrated assessment and intervention strategies.

Mechanistically, the etiology of PMS remains multifactorial, with hormonal fluctuations, neurotransmitter dysregulation, and heightened sensitivity to normal levels of progesterone and estrogen implicated in symptom pathogenesis (6,7,24). The prominence of somatic symptoms in this cohort may be further explained by culturally mediated somatization—a phenomenon where psychological distress is predominantly expressed as physical symptoms (25,26). Environmental stressors common in low- and middle-income settings, such as economic hardship, familial responsibilities, and restricted healthcare access, likely exacerbate



both somatic and psychological symptom reporting. The absence of significant associations between PMS and demographic or reproductive factors such as age, BMI, marital status, or contraceptive use is notable and echoes the results of several large-scale studies, which found minimal influence of these variables on PMS prevalence (27,28). While some research suggests a protective effect of combined oral contraceptives against PMS, our findings align with studies reporting either no effect or a possible association with mood disturbance among predisposed women (29,30,31).

Clinically, these findings have important implications for practice in similar resource-limited settings. The substantial symptom burden and its impact on daily functioning highlight the need for greater awareness, early recognition, and targeted management of PMS in primary care and gynecological clinics. Education campaigns should aim to destigmatize menstrual health issues, improve health literacy, and encourage the use of validated screening tools to facilitate diagnosis and appropriate care. Interventions may include a combination of lifestyle modification, cognitive-behavioral approaches, and, where indicated, pharmacological therapies—tailored to the predominant symptom domains and individual preferences (32,33,34).

The study's strengths include its rigorous application of validated diagnostic criteria, systematic data collection using trained interviewers and electronic data capture, and a comprehensive assessment of both somatic and psychological symptoms. The cross-sectional design, however, introduces certain limitations, such as the inability to assess temporal causality or symptom fluctuation over multiple cycles. The non-probability sampling and single-center setting may restrict generalizability to the broader Pakistani population, particularly rural or less health-literate groups. Although the sample size was robust and based on prior prevalence estimates, it may not have been sufficient to detect subtle associations between PMS and less common risk factors or to fully explore effect modification by lifestyle or environmental exposures. Reliance on self-report and retrospective recall may also introduce reporting and recall bias, despite efforts to standardize symptom assessment. Future research should focus on prospective cohort designs to monitor symptom trajectories and responses to intervention, as well as qualitative studies to explore sociocultural barriers and facilitators to care. Expanding to multicenter or community-based samples could enhance the representativeness and applicability of findings. In addition, there is a need for research on the effectiveness of culturally adapted educational and therapeutic interventions that address both the somatic and psychological dimensions of PMS. Ultimately, this study adds to the growing body of evidence emphasizing the importance of recognizing and managing PMS as a significant reproductive health concern, particularly within low- and middle-income countries where the psychosocial and economic burdens of the syndrome are likely to be most acute.

## CONCLUSION

This study demonstrates that premenstrual syndrome is a highly prevalent and distressing condition among women of reproductive age in a low- and middle-income urban population, with somatic symptoms such as back pain, general body discomfort, and headache predominating over psychological complaints. The identification of a 52% prevalence of PMS among women attending a major gynecology clinic in Karachi highlights the urgent need for improved clinical recognition, patient education, and accessible management strategies tailored to the unique symptom patterns and social context of this population. These findings underscore the importance of routine PMS screening in primary and reproductive healthcare settings and support the development of targeted interventions to reduce the burden of PMS on daily functioning and quality of life. Further research should focus on prospective, multicenter studies and culturally adapted interventions to optimize the diagnosis and treatment of PMS, thereby advancing women's health in low-resource settings.

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