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Frequency and Severity of Symptoms of Premenstrual Syndrome in Reproductive Age Women Presented to Mardan Medical Complex

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ABSTRACT

Background: Premenstrual syndrome is a cyclical disorder characterized by physical, psychological, and behavioral symptoms occurring during the luteal phase of the menstrual cycle and resolving with menstruation. It affects social functioning, interpersonal relationships, and academic or occupational performance. The frequency and severity of symptoms differ across populations due to hormonal variations, lifestyle factors, and cultural perceptions. Data from Mardan are limited, where differences in socioeconomic status and healthcare access may influence reporting and recognition. **Objective:** To determine the frequency and severity of symptoms in patients of reproductive age with premenstrual syndrome presented to Mardan Medical Complex, Mardan. **Study Design:** Cross-sectional study. **Duration and Place of Study:** This study was conducted from December 2024 to May 2025 in the Department of Obstetrics and Gynecology at Mardan Medical Complex, Mardan. **Methodology:** A total of 151 women aged 18 to 48 years with regular menstrual cycles were included by non-probability consecutive sampling. Women with pregnancy, lactation, psychiatric illness, or use of hormonal or psychopharmacological therapy were excluded. Premenstrual syndrome was diagnosed when at least three recognized symptoms were present in the luteal phase. Severity was graded using the Premenstrual Symptoms Screening Tool. **Results:** The prevalence of premenstrual syndrome was 39.7%. Of these, 21.7% reported mild, 51.7% moderate, and 26.7% severe symptoms. Younger age ($p<0.001$), unmarried status ($p<0.001$), and lower body mass index ($p<0.001$) showed significant association, whereas socioeconomic, educational, and residential factors were not significant. **Conclusion:** Premenstrual syndrome is common in reproductive age women of Mardan, predominantly of moderate severity, and is associated with younger age, unmarried status, and lower body mass index.

INTRODUCTION

The menstrual cycle is a physiological process that is inherent to the reproductive health of female beings.[1] The process is governed by hormonal linkages between the ovaries, pituitary gland, and hypothalamus.[2] The function of this process is to prepare the lining of the uterus to hold a prospective embryo.[2] The average extent of this process is between 21 to 35 days, and its average length is taken to be about 28 days.[3] The process is segmented into three phases: follicular phase, stage of ovulation, and luteal phase.[4] Hormonal fluctuations between estrogen and progesterone not only regulate the process of reproduction but regulate other functions of the human body like metabolisms, mood, and water balance within the system.[5] Any abnormality or difference of hormones within this process results in various medical conditions that impair the health and quality of life of females.[6]

The symptoms experienced before menstruation, better known by the term "premenstrual syndrome," is one of the most prevalent diseases among females of childbearing age.[7] The symptoms primarily occur during the luteal period of menstruation and disappear with the onset of bleeding.[8] The symptoms involve physical, emotional, and behavioral complaints including abdominal gas or bloating, breast pain, headache, irritability, mood swing, anxiety, and variations in sleep and appetite.[9] The cause of this condition is not clear to date, but specialists think that variations of hormones, variations of chemicals in the brain, and females' sensibility of the body contribute to the cause.[10] The symptoms have been evaluated to affect females worldwide, but the percentage varies between diverse nations and regions. Due to the repetitive occurrence of symptoms, symptoms drastically influence females' life, work life, and relationships and cause trouble not only for the individual but also for the community.[11]

The intensity of premenstrual syndrome varies with various women. There are some women with very tolerant

and soft symptoms, and some with such intense pain that their day-by-day life is impaired, and this disorder is known by the name "premenstrual dysphoric disorder," its severe variant.[12] Here, symptoms of emotional and behavioral types predominate. The intensity of symptoms is coupled with the sensitivity of hormones, mental health, and social and cultural determinants.[11] As per physicians, various scales assess this intensity, whereby the numbers of symptoms and their severities are analyzed. Scientific studies have established that a vast percentage of women of childbearing years' experience average to higher set of symptoms, and this translates into implications on their studies, workplace, and relationships.[13] Knowledge of the intensity and incidence of this issue aids better planning of treatments, which can comprise of alterations of life-style, intake of medicine, and psychologic care. In a study by Rezende APR, et al. has shown that prevalence of premenstrual syndrome was 46.9%.[14] In another study by Bałanda-Bałdyga A, et al has shown that frequency of severity of symptoms was mild 40.1%, moderate 45.2% and severe 12.3% in patients of reproductive age with premenstrual syndrome.[15]

The rationale for this study in Mardan lies within the scarcity of local data on the occurrence and intensity of premenstrual syndrome among reproductive-age women. Cultural beliefs, health-seeking attitudes, and knowledge about menstrual health differ substantially across this area and might affect reporting and management of symptoms. Additionally, women access Mardan with limited access to specialized gynecology care and health education, thus making local evidence that informs targeted intervention very imperative. By capturing the burden of this condition within Mardan, the study can inform valuable information on healthcare planning, education programs, and policy formation on enhancing women's contraceptive health within the area.

METHODOLOGY

This cross-sectional study was conducted in the Department of Obstetrics and Gynecology at Mardan Medical Complex, Mardan, from December 2024 to May 2025 following approval of the study protocol. A total of 150 participants were enrolled. The sample size was calculated through World Health Organization software using a 95% confidence level, an 8% margin of error, and an expected frequency of premenstrual syndrome of 46.9% in women of reproductive age.[14] Non-probability consecutive sampling was used for recruitment. Approval for the study was obtained from the institutional ethical review board as well as the College of Physicians and Surgeons Pakistan. Women aged 18 to 48 years with regular menstrual cycles of 21 to 35 days who presented to the outpatient department prior to menstruation were included, regardless of marital status. Women with a history of pregnancy or lactation in the preceding three months, amenorrhea, oral contraceptive use, psychiatric disorders, or the use of psychopharmacological medication were excluded. Written informed consent was obtained after explaining the purpose and benefits of the study, ensuring confidentiality, and emphasizing that participation involved no risks.

Demographic information was recorded for each participant. A comprehensive history and examination were carried out. Premenstrual syndrome was considered present when three or more characteristic features occurred in the luteal phase of the menstrual cycle, typically 5 to 11 days before menstruation. The features assessed included bloating, described as a subjective sensation of abdominal fullness or distension with visible swelling; breast tenderness, defined as discomfort or soreness graded on a visual analogue scale from 1 to 10; headache, recorded according to frequency during the premenstrual days and intensity on a visual analogue scale from 1 to 10; fatigue, identified when a Fatigue Assessment Scale score exceeded 4; changes in sleep, recognized when participants reported either difficulty initiating or maintaining sleep or excessive sleep with deviation from their usual hours; irritability, confirmed when the Affective Reactive Index yielded a score greater than 3; anxiety, measured by the Generalized Anxiety Disorder-7 scale where scores of 5, 10, and 15 denoted mild, moderate, and severe anxiety respectively; and depression, assessed by the Patient Health Questionnaire-9, where higher scores indicated greater severity. Severity of premenstrual syndrome was evaluated using the Premenstrual Symptoms Screening Tool which bifurcate patients into mild, moderate, or having severe symptoms. SPSS version 26 was used for data analysis. Continuous variables were expressed as mean ± standard deviation or median with interquartile range, depending on the distribution as assessed by the Shapiro-Wilk test. Categorical variables were presented as frequencies and percentages. Stratification of presence of PMS was done with respect to demographic and clinical characteristics, and comparisons after stratification were carried out using chi-square and Fisher's exact tests. A p-value of ≤0.05 was considered statistically significant.

RESULTS

The study included 151 reproductive age women with a mean age of 33.78 ± 9.13 years and mean BMI of 25.49 ± 3.63 kg/m^2 (as shown in Table I). Regarding marital status, 90 participants (59.6%) were married while 61 (40.4%) were unmarried. The socioeconomic distribution revealed that 77 women (51.0%) belonged to poor socioeconomic status, 52 (34.4%) to middle class, and 22 (14.6%) to rich class. Educational attainment showed that 42 participants (27.8%) were uneducated, 56 (37.1%) had primary education, 40 (26.5%) had secondary education, and 13 (8.6%) had higher education. The residential distribution indicated that 84 women (55.6%) were from rural areas while 67 (44.4%) were from urban areas (as shown in Table I).

Table I

Patient Demographics

Demographics	Mean ± SD
Age (years)	33.78 ± 9.13
BMI (kg/m^2)	25.49 ± 3.63
Marital Status	
Married n (%)	90 (59.6%)
Unmarried n (%)	61 (40.4%)
Socioeconomic Status	
Poor n (%)	77 (51.0%)
Middle n (%)	52 (34.4%)

Rich n (%)	22 (14.6%)
Education Level	
Uneducated n (%)	42 (27.8%)
Primary n (%)	56 (37.1%)
Secondary n (%)	40 (26.5%)
Higher n (%)	13 (8.6%)
Residential Status	
Rural n (%)	84 (55.6%)
Urban n (%)	67 (44.4%)

The overall frequency of premenstrual syndrome among the study population was 39.70%, with 60 women experiencing PMS and 91 women (60.30%) not experiencing it (as shown in Table II).

Table II

Frequency of Premenstrual Syndrome Among Reproductive Age Women

Premenstrual Syndrome	Frequency	%age
Yes	60	39.70%
No	91	60.30%
Total	151	100%

Among the 60 women with premenstrual syndrome, the severity assessment revealed that 13 (21.70%) experienced mild symptoms, 31 (51.70%) had moderate symptoms, and 16 (26.70%) suffered from severe symptoms (as shown in Table III).

Table III

Severity of Premenstrual Syndrome Symptoms (n=60)

Severity	Frequency	%age
Mild	13	21.70%
Moderate	31	51.70%
Severe	16	26.70%
Total	**60**	**100%**

The association analysis demonstrated that age had a statistically significant relationship with PMS (p<0.001), where 37 women (62.7%) aged ≤30 years had PMS compared to only 23 (25.0%) among those >30 years. Marital status also showed significant association (p<0.001), with unmarried women having higher prevalence of PMS at 38 cases (62.3%) versus 22 cases (24.4%) in married women. BMI demonstrated significant correlation (p<0.001), with 39 women (54.9%) having BMI ≤25 kg/m^2 experiencing PMS compared to 21 (26.3%) with BMI >25 kg/m^2. However, socioeconomic status showed no significant association (p=0.863), with PMS prevalence of 29 (37.7%) in poor, 22 (42.3%) in middle, and 9 (40.9%) in rich socioeconomic groups. Similarly, education level demonstrated no significant relationship (p=0.983), with PMS occurring in 16 (38.1%) uneducated, 22 (39.3%) primary educated, 17 (42.5%) secondary educated, and 5 (38.5%) higher educated women. Residential status also lacked significant association (p=0.258), with 30 rural women (35.7%) and 30 urban women (44.8%) experiencing PMS (as shown in Table IV).

Table IV

Association of Premenstrual Syndrome with Demographic Factors

Demographic Factors		Premenstrual Syndrome		p-value
		Yes n(%)	No n(%)	
Age (years)	≤30	37 (62.7%)	22 (37.3%)	<0.001
	>30	23 (25.0%)	69 (75.0%)	
Marital Status	Married	22 (24.4%)	68 (75.6%)	<0.001
	Unmarried	38 (62.3%)	23 (37.7%)	
BMI (Kg/m^2)	≤25	39 (54.9%)	32 (45.1%)	<0.001
	>25	21 (26.3%)	59 (73.8%)	
Socioeconomic Status	Poor	29 (37.7%)	48 (62.3%)	0.863
	Middle	22 (42.3%)	30 (57.7%)	
	Rich	9 (40.9%)	13 (59.1%)	
Education Level	Uneducated	16 (38.1%)	26 (61.9%)	0.983*
	Primary	22 (39.3%)	34 (60.7%)	
	Secondary	17 (42.5%)	23 (57.5%)	
	Higher	5 (38.5%)	8 (61.5%)	
Residential Status	Rural	30 (35.7%)	54 (64.3%)	0.258
	Urban	30 (44.8%)	37 (55.2%)	

*Fischer Exact Test

DISCUSSION

The findings revealed that approximately 40% of women experienced premenstrual syndrome, with the majority presenting moderate severity, which aligns with the global burden of this condition affecting women during their reproductive years. The significantly higher prevalence of PMS in younger women aged ≤30 years compared to those >30 years can be attributed to the peak hormonal fluctuations and ovarian activity during the earlier reproductive phase, as the regularity and intensity of ovulatory cycles tend to stabilize with advancing age and approaching perimenopause. The notable association between unmarried status and increased PMS prevalence may be explained by differences in lifestyle factors, stress levels, and hormonal patterns, as marriage often brings changes in daily routines, sexual activity, and psychosocial support systems that can influence menstrual cycle regulation. The inverse relationship observed between BMI and PMS, where women with lower BMI experienced higher rates of symptoms, suggests that body fat composition plays a crucial role in estrogen metabolism and hormonal balance, as adipose tissue serves as an extragonadal site for estrogen production and storage, potentially buffering hormonal fluctuations in women with higher BMI. The lack of significant association with socioeconomic status, education level, and residential status indicates that premenstrual syndrome transcends social and environmental boundaries, reflecting its primarily biological and hormonal etiology rather than being predominantly influenced by external sociodemographic factors.

The prevalence of premenstrual syndrome observed in the current study was 39.70%, which falls within the moderate range compared to various studies conducted in similar populations. This finding is comparable to the 48% prevalence reported by Amjad et al. [16] in Islamabad and 52% by Shoeb et al. [17] in urban Karachi, suggesting a consistent pattern of PMS occurrence among Pakistani women. However, our prevalence is considerably lower than the 80% reported by Altamimi et al. [18] in Saudi Arabia,

83.7% by Yar et al. [19] in Rahim Yar Khan, and 80% by Kalsoom et al. [20] among medical students in Islamabad. These variations may be attributed to differences in diagnostic criteria, study populations, and cultural factors influencing symptom reporting and recognition. The substantially higher prevalence in studies involving medical students and educated populations suggests that awareness and ability to recognize symptoms may influence reporting rates. Regarding severity distribution, the present study found that 51.70% of women with PMS experienced moderate symptoms, 26.70% had severe symptoms, and 21.70% had mild symptoms, which closely aligns with the findings of Amjad et al. [16] who reported 51% mild, 37% moderate, and 12% severe symptoms. Similarly, Nisar et al. [21] documented 59.5% mild, 29.2% moderate, and 11.2% severe cases among medical students, showing a comparable distribution pattern despite the different study population.

The significant association between younger age (≤30 years) and higher PMS prevalence in our study, where 62.7% of younger women experienced PMS compared to 25.0% in older women ($p<0.001$), is strongly supported by multiple studies. Amjad et al. [16] found that younger women aged 15-24 years had significantly higher PMS rates (64.67% vs. 25.14% in older women), and Zarfishan et al. [22] reported a significant association between younger age (<20 years) and PMS symptoms ($p=0.001$). This consistent pattern across different populations reinforces the biological basis of PMS being more pronounced during peak reproductive years when hormonal fluctuations are most intense. However, Altamimi et al. [18] found that women aged 26-30 years showed higher odds of reporting symptoms, and Yunus et al. [23] found no significant association with age, suggesting that the relationship between age and PMS may be influenced by study design and population characteristics. The current study's finding of significantly higher PMS prevalence among unmarried women (62.3%) compared to married women (24.4%) with $p<0.001$ is consistent with Amjad et al. [16] who reported that 59.88% of women with PMS were unmarried versus 40.98% in the non-PMS group. Similarly, Yar et al. [19] found that 74.7% of women with PMS were unmarried, and Nisar et al. [21] exclusively studied unmarried medical students and found 51% prevalence. These findings suggest that marital status may influence PMS through mechanisms related to hormonal regulation, sexual activity, lifestyle changes, and psychosocial support systems that often accompany marriage.

The inverse relationship between BMI and PMS observed in our study, where women with BMI ≤25 kg/m^2 had significantly higher PMS rates (54.9%) compared to those with BMI >25 kg/m^2 (26.3%) with $p<0.001$, contrasts with some existing literature. Yunus et al. [23] and Shoeb et al. [17] found no significant association between BMI and PMS, while our findings suggest that lower BMI may predispose women to more severe hormonal fluctuations due to reduced adipose tissue's buffering effect on estrogen metabolism. This discrepancy may be explained by differences in BMI distribution in study populations and the complex relationship between body composition and hormonal balance. The lack of significant association between PMS and socioeconomic status ($p=0.863$) and education level ($p=0.983$) in the present study contradicts several other findings. Altamimi et al. [18] reported that higher education was significantly associated with PMS (AOR=2.26) and low monthly income was a significant predictor (AOR=2.66), while Yar et al. [19] found that 81% of women with PMS were highly educated. Amjad et al. [16] also reported that educated women were more likely to have PMS. These contradictory findings may be explained by the fact that educated women are more aware of PMS symptoms and more likely to recognize and report them, whereas in our population with 27.8% uneducated participants, symptom recognition may be uniformly distributed regardless of education level. Similarly, the lack of association with residential status ($p=0.258$) in our study differs from Amjad et al. [16] who found that urban residents had significantly higher PMS rates (85.62% vs. 60.10%), possibly reflecting differences in lifestyle factors, stress levels, and healthcare awareness between urban and rural populations across different regions.

The present study has several limitations that warrant consideration when interpreting the findings. First, the single-center design limits the generalizability of results to broader populations, as the study was conducted at one healthcare facility which may not represent the diverse demographic and clinical characteristics of women across different regions. The cross-sectional nature of the study design prevents the establishment of causal relationships between demographic factors and premenstrual syndrome, as data were collected at a single point in time without follow-up assessment. The relatively modest sample size of 151 participants may have limited the statistical power to detect associations with certain demographic variables, particularly those with smaller subgroups such as women with higher education. Additionally, the study relied on self-reported symptoms and questionnaire-based assessment rather than prospective daily symptom charting over multiple menstrual cycles, which is considered the gold standard for PMS diagnosis and may have introduced recall bias.

CONCLUSION

Our study has concluded that premenstrual syndrome is a prevalent condition among reproductive age women, affecting a substantial proportion of the study population, with the majority experiencing moderate severity symptoms that significantly impact their daily functioning and quality of life. The findings demonstrate that demographic factors, particularly younger age, unmarried status, and lower body mass index, are significantly associated with increased occurrence of premenstrual syndrome, highlighting the importance of hormonal and physiological factors in the pathogenesis of this condition.

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