PREMENSTRUAL DYSPHONIC DISORDER A CROSS-SECTIONAL STUDY ON PREVALENCE AND AWARENESS AMONG MEDICAL STUDENTS

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Abstract
Background: Premenstrual Dysphoric Disorder (PMDD), is a severe form of premenstrual syndrome that significantly affects women's mental and physical health. Despite being recognized in the DSM-5, it remains underdiagnosed, especially in South Asia.
Objective: To determine the prevalence of PMDD and access awareness levels among medical and dental students.
Methodology: A descriptive cross-sectional study was conducted from January to June 2023 among 173 medical and dental students in Lahore, using a structured questionnaire. Female students were assessed with the Premenstrual Symptoms Screening Tool (PSST). Descriptive statistics and chi-square tests were applied using SPSS v26.
Findings: Among 173 participants, 165 were female (mean age 21.45 ± 1.42 years). Only 12 females (7.27%) met PMDD criteria, while 125 (75.7%) had some premenstrual symptoms. Awareness was significantly higher among females than males ($p < 0.05$), with 74.5% of females versus 30.4% of males reporting prior knowledge of PMDD.
Conclusion: PMDD prevalence among female students was 7.27%, but awareness gaps remain, particularly among male peers. Integrating reproductive health education into medical curricula and encouraging early screening may improve recognition and management.

Key words: PMDD, prevalence, awareness, medical students, Pakistan

Introduction

Premenstrual Dysphoric Disorder (PMDD) was officially recognized as a distinct diagnostic category a decade ago, being included in both the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) and the 11th edition of the International Classification of Diseases (ICD-11).[1] According to the World Health Organization's ICD-11, PMDD is described as a pattern of mood disturbances (such as sadness and irritability), physical symptoms (like fatigue, joint pain, and overeating), or cognitive

issues (including difficulty concentrating and memory lapses) that typically emerge a few days before the start of menstruation.[2] While premenstrual syndrome (PMS) is common and affects about 90% of women during the luteal phase of their menstrual cycle, fewer than 10% of cases progress to a diagnosis of PMDD.[3] PMDD is considered a more severe form of PMS, marked by intense symptoms that significantly disrupt normal functioning.[4] These symptoms may appear at any stage between menarche and menopause, often intensifying during the week preceding menstruation before improving afterward.[5]

Within a few days after menstruation begins, the symptoms of PMDD typically subside or are less noticeable in the following weeks. To meet the diagnostic criteria, these symptoms must have been present during the majority of the past year's menstrual cycles.[6] PMDD can have profound effects, contributing to both physical and emotional limitations, as well as impairing social and work functions.[7] Women diagnosed with PMS are more likely to experience increased absenteeism from work and difficulties in fulfilling work, educational, and household responsibilities.[8] Additionally, PMDD can lead to a diminished sense of self-worth, feelings of inadequacy, dissatisfaction, and a tendency toward a more sedentary lifestyle.[9] Furthermore, women experiencing PMDD are at a higher risk of suicide compared to the general population.[10] While the exact cause of PMDD remains unknown, ongoing research in this field is promising.[11] Some studies suggest that abnormalities in neurotransmitter function, particularly fluctuations in gonadal steroid hormones, may contribute significantly to the development of PMDD symptoms.[12] Research has also indicated that changes in estrogen and progesterone levels, occurring cyclically, may play a key role in triggering symptoms. In addition, nutritional factors and vitamin deficiencies have been proposed as potential contributors. However, further investigations are necessary to establish the precise origins of PMDD.[13] Although the underlying mechanisms of PMDD are not fully understood, various treatment approaches have been proposed based on existing theories, primarily aimed at managing the symptoms. A concise review by Carlini and Deligiannidis highlights the effectiveness of selective serotonin reuptake inhibitors (SSRIs) as the first-line treatment. Oral contraceptives (OCPs) are considered second-line options, with evidence suggesting they can significantly alleviate PMDD symptoms.[14] In cases where SSRIs and OCPs are ineffective, leuprolide, a gonadotropin-releasing hormone agonist that induces ovarian suppression, may be considered as a last resort, though it carries severe side effects.[15] A Brazilian study (2018) reported that 17.6% of 727 young women were affected by PMDD.[16] In Ethiopia, a study of 254 women found a high prevalence of PMDD, with 66.9% of participants being affected. This study also found a significant correlation between the severity of dysmenorrhea and the occurrence of PMDD.[17] A recent Indian study of 661 medical and paramedical students reported a PMDD prevalence of 5.04%, with fatigue and physical symptoms (e.g., breast tenderness, headache, bloating) being the most common. A study in Jordan found a PMDD prevalence of 10.2% among 254 women aged 18 to 45.[18] In Saudi Arabia, a study conducted at Umm al-Qura University revealed that 36.6% of female medical students had PMDD. Given the relatively recent classification of PMDD as a distinct disorder, it is not surprising that awareness of this condition remains limited. A 2018 study in Karachi, conducted among 448 female university students, found that while 96.4% were familiar with PMS, only 19% were aware of PMDD.[19] Therefore, enhancing awareness of PMDD among both the general population and medical students is crucial to reduce the number of undiagnosed cases and improve the quality of life for women affected by this condition. This study seeks to assess the awareness of PMDD among male and female medical students, as well as determine its prevalence and identify the factors associated with PMDD among female medical students.

Materials and Methods
Study Design, Area, and Setting
A descriptive cross sectional study was conducted from January to June 2023, conducted at the Al-Aleem Medical College, Lahore. The study targeted both male and female medical students during the 2023-2024 academic year. Students in phases 2 and 3 were invited to participate, with phase 2 consisting of preclinical students in their third and fourth years, and phase 3 comprising clinical students in their fifth and sixth years. Phase 1 students, in their first and second years, were excluded

due to being in the preparatory stages before entering the medical program. A convenience sampling method was used for participant selection. Two sample size calculations were conducted to meet the study's objectives. For assessing PMDD awareness, a sample size of 173 was required, determined using the Raosoft Online Sample Size Calculator (Raosoft, Inc., Seattle, WA), with a confidence interval of 95%, a margin of error of 5%. Additional exclusion criteria were applied to meet the DSM-5 guidelines for PMDD prevalence. Female students with chronic medical conditions (such as thyroid disorders or polycystic ovary syndrome) or a history of mental health issues (including major depressive disorder, panic disorder, persistent depressive disorder, or personality disorders) or those receiving treatments that might influence PMDD were excluded. Participants were asked to provide written consent at the beginning of the questionnaire. To ensure anonymity, personal information (such as names, phone numbers, and student IDs) was not collected.

Development of the Questionnaire

The questionnaire used in this study was available in English and had two versions: one for male students and another for female students. Since the students were expected to have sufficient English proficiency to understand the questionnaire, it was administered in that language. The male version included two sections: demographic information and assessment of PMDD awareness. The female version included those same two sections, plus two additional sections on reproductive health and premenstrual screening. The questions were primarily multiple-choice or dichotomous. The questionnaire was carefully designed following a comprehensive review of existing literature.

Demographic Questions

The first section of the questionnaire in both versions gathered demographic data, such as age, academic year, residency, marital status, parenthood, and mental health history. The female version included additional questions about weight, height, smoking habits, alcohol use, contraceptive use, number of previous pregnancies, current medications, medical conditions, and mental health history.

Awareness of PMDD

The second section aimed to assess the awareness of PMDD among medical students. This section included nine questions: the first six explored general knowledge of aspects affected by menstruation, such as mood, appetite, sleep quality, social withdrawal, and productivity at work, school, and in hobbies. One question assessed participants' understanding of PMDD as a medical condition, and another asked about PMDD's recognition as a distinct disorder according to the DSM-5. The final question explored the likelihood of seeking medical treatment for PMDD symptoms in a friend or relative. Responses were scored with a "yes," "no," or "I don't know" option, with correct answers receiving a score of one and incorrect answers receiving a score of zero. A cumulative score out of 9 was calculated for each participant to compare awareness between genders. Correct answers indicated a positive attitude toward PMDD, while incorrect answers suggested a lack of understanding. Cronbach's alpha for reliability of this section, calculated after a pilot study, was found to be 0.513, suggesting adequate reliability.[20]

Reproductive Characteristics

The third section of the female version focused on reproductive characteristics, including age at menarche, average cycle length, cycle regularity, bleeding days per cycle, amount of bleeding, presence of dysmenorrhea, and its severity.

Premenstrual Symptoms Screening

The fourth section, exclusive to the female version, gathered data on previous PMDD diagnoses and family history of PMDD. The Premenstrual Symptoms Screening Tool (PSST), a validated tool for assessing PMDD symptoms, was also included.[21] The PSST, based on DSM-4 criteria, provides a scale for rating the severity of various premenstrual symptoms and functional impairment. It consists of 14 items assessing symptoms and 5 items evaluating functional impact, with participants rating

each symptom from "not at all" to "severe." A positive PMDD screen requires severe ratings for at least one of four items (irritability, anxiety, tearfulness, and depressed mood), at least four symptoms rated as moderate or severe, and at least one instance of functional impairment.

Data Analysis

Data was analysis using SPSS software version 26. Percentages and frequencies were used to describe categorical variables such as gender, marital status, and reproductive characteristics. The median and interquartile range (IQR) were applied to describe non-normally distributed data. The chi-square test was used to examine relationships between PMDD and various factors. A p-value of less than 0.05 was considered statistically significant.

Results

Sociodemographic Characteristics of Respondents

A total of 173 medical students participated in the study, comprising 88 female students and 85 male students, resulting in an overall response rate of 46.37%. Table 1 summarizes the demographic information of the respondents. The mean age of participants was 21.45 ± 1.42 years. Among females, 67.8% had normal menstrual cycles, and 32.1% reported irregular cycles. The median age of both male and female participants was 21 years. The interquartile range (IQR) for female participants was 20–23 years, while for male participants it was 20–22 years.

Among the female participants, 15 individuals (17.05%) reported using medications, while 73 (82.95%) indicated no current medication use. The most frequently used drugs were antidepressants and antianxiety medications, with 15 out of 88 female participants (17.05%) reporting their use.

A history of mental illness was disclosed by 12 female participants (13.64%) and 3 male participants (3.53%). Among the female group, the most commonly reported mental health conditions were:

- Generalized anxiety disorder: 7 participants (7.95%)
- Depression: 5 participants (5.68%)
- Social anxiety disorder: 2 participants (2.27%)

In terms of chronic medical conditions, 10 female students (11.36%) reported such diagnoses, with polycystic ovary syndrome and hypothyroidism being the most prevalent.

Among the male participants, 70 students (82.35%) reported having sisters, while 15 (17.65%) indicated they had no sisters.

Table 1: Participant Profile Overview (N = 173)

Category	Female Students (n = 88)	Male Students (n = 85)
Academic Phase		
Early Medical Training	52 (59.1%)	64 (75.3%)
Advanced Clinical Years	36 (40.9%)	21 (24.7%)
Living Arrangement		
Residing with Family	85 (96.6%)	
Living Independently	3 (3.4%)	
Relationship Status		
Not Married	76 (86.4%)	78 (91.8%)
Engaged or Dating	9 (10.2%)	5 (5.9%)
Legally Married	2 (2.3%)	1 (1.2%)
Previously Married (Divorced)	1 (1.1%)	0 (0.0%)
Parental Status		
Has Children	1 (1.1%)	1 (1.2%)
Siblings (Sisters)		70 (82.4%)
Body Weight Classification		
Low Weight (<18.5 BMI)	16 (18.2%)	
Healthy Weight (18.5–24.99 BMI)	51 (58.0%)	
Above Normal (≥25 BMI)	21 (23.9%)	
Lifestyle and Health Background		

Actively Smokes	5 (5.7%)	5 (5.9%)
Uses Birth Control Methods	2 (2.3%)	
Takes Prescribed Medication	15 (17.0%)	
Reported Mental Health Diagnoses	12 (13.6%)	3 (3.5%)
History of Ongoing Health Issues	10 (11.4%)	

Understanding of PMDD Among Participants

An analysis of responses to questions evaluating awareness of Premenstrual Dysphoric Disorder (PMDD) revealed notable differences in knowledge levels between genders. Since the distribution of awareness scores did not meet the assumption of normality, the Mann-Whitney U test was employed to examine differences between male and female participants. Results indicated that female students exhibited significantly greater awareness regarding PMDD compared to their male peers.

The first question, which explored general recognition of mood fluctuations related to the menstrual cycle, received the highest number of accurate responses from both groups. In contrast, the lowest proportion of correct responses among females (44.7%) was recorded for the item concerning whether professional medical advice should be sought in response to such symptoms. For male respondents, the question most frequently answered incorrectly (with only 24.1% correct) was the one that assessed whether they viewed emotional and physical premenstrual symptoms as a legitimate medical condition.

A particularly significant gap was observed in responses to a question that addressed the recognition of PMDD as a disorder officially defined in the DSM-5 classification system. Among the female students, 66% correctly identified PMDD as a recognized condition, while only 27.3% of male students did the same.

When it came to attitudes specifically, the inclination to consider medical help for a friend or family member showing potential PMDD symptoms approximately 44.7% of female participants and 42.7% of male participants expressed a supportive attitude toward seeking care, suggesting a somewhat aligned yet moderate awareness of appropriate responses to PMDD. The Reproductive Profile of Female Participants is shown in Table 2. These findings, summarized in Figure 1, underscore the importance of enhancing education and awareness about PMDD, particularly among male medical students, to ensure better recognition, empathy, and support for those affected. While the PMDD Prevalence and Symptom Patterns is shown in Table 3.
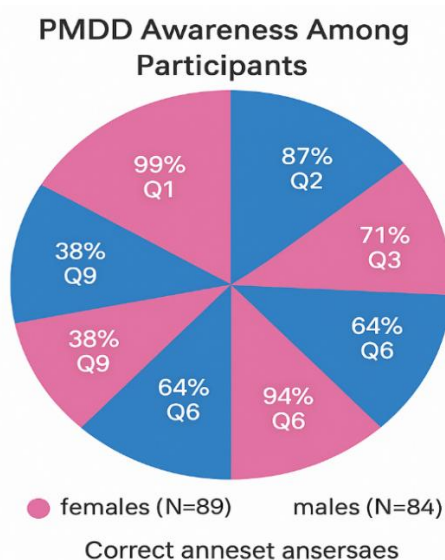

Figure 1: Proportion of participants who responded correctly to each item assessing awareness of PMDD:

- **Q1:** Is it possible for women to undergo mood fluctuations prior to or during their menstrual periods?
- **Q2:** Might changes in appetite, such as a decrease or increase, occur around the time of menstruation?
- **Q3:** Can menstruation influence how well or how long women sleep?
- **Q4:** Do some women tend to isolate themselves socially in the days leading up to or during menstruation?
- **Q5:** Is it true that menstrual cycles can interfere with regular daily tasks or responsibilities?
- **Q6:** Can emotional and physical symptoms linked to menstruation be so intense that they disrupt a woman's ability to function daily?
- **Q7:** Are the emotional and physical issues that hinder day-to-day life before or during menstruation considered a medical condition?
- **Q8:** Do these disturbances have a clinical diagnosis, such as Premenstrual Dysphoric Disorder (PMDD)?
- **Q9:** If someone close to you was dealing with these symptoms, would you advise or consider seeking professional help?

Table 2: Reproductive Profile of Female Participants (n = 173)

Variable	Category	Frequency (n)	Percentage (%)
Age at Menarche (Mean)			**12.5 years**
Menstrual Cycle Length	≤ 25 days	49	28.3%
	> 25 days	123	71.1%
Menstrual Regularity	Irregular	29	16.8%
	Regular	142	82.1%
Duration of Menstrual Bleeding	≤ 6 days	121	69.9%
	> 6 days	52	30.0%
Amount of Bleeding	Spotting	2	1.1%
	Mild	87	50.3%
	Moderate	71	41.0%
	Severe	10	5.8%
Dysmenorrhea (Menstrual Pain)	Reported	62	35.8%
Severity	Mild	36	20.8%
	Moderate	62	35.8%
	Severe	29	16.8%
History of PMS	Yes	3	1.7%
	No	168	97.1%
History of PMDD (Diagnosed)	Yes	3	1.7%
Family History of PMDD	Positive	9	5.2%
	Negative	163	94.2%

Table 3: PMDD Prevalence and Symptom Patterns (n = 137 Screened Participants)

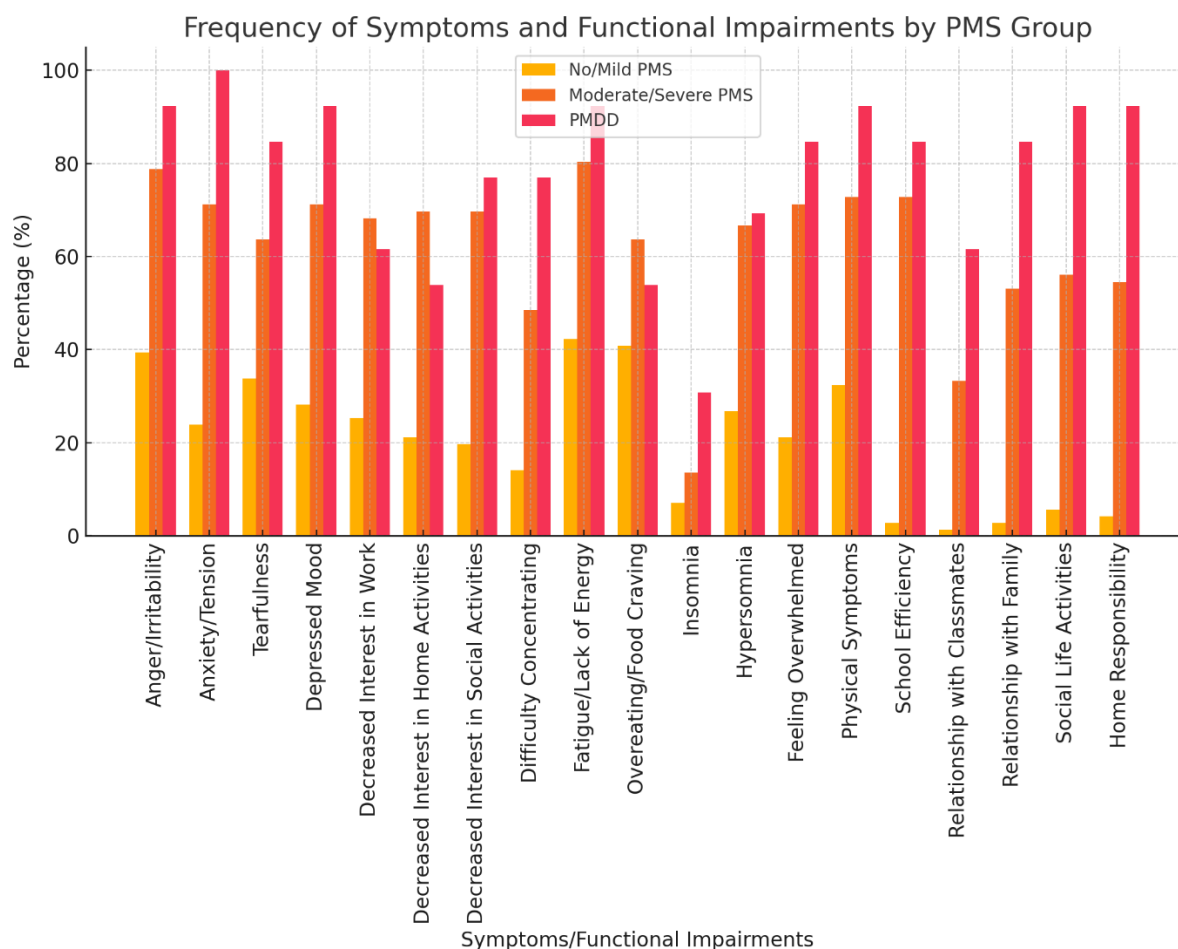| Variable	Category	Frequency (n)	Percentage (%)
Total Screened (PSST)		137	100%
Excluded Due to Conditions/Treatment		36	
PMDD Diagnosis	Positive	12	8.76%
PMS Severity	Moderate to Severe PMS	60	43.8%
	No or Mild PMS	65	47.4%

Figure 2: Description of the Graph:

The bar graph illustrates the comparative prevalence of various premenstrual symptoms and functional impairments across three participant groups: No/Mild PMS, Moderate/Severe PMS, and PMDD. Each bar cluster corresponds to a specific symptom or area of functional impairment, with individual bars representing the proportion of participants within each group who reported experiencing that issue.

Key observations include:

• Emotional and psychological symptoms such as *anger/irritability*, *anxiety/tension*, *depressed mood*, and *feeling overwhelmed* showed a clear increase in frequency from the No/Mild PMS group to the PMDD group, with PMDD participants reporting the highest rates (often above 90%).

• Cognitive and behavioral symptoms, including *difficulty concentrating* and *fatigue*, followed a similar pattern, with PMDD individuals significantly more affected.

• In terms of functional impairments, the most impacted domains in the PMDD group were *social life activities*, *home responsibilities*, and *school efficiency*, each affecting over 84% of participants.

• The moderate/severe PMS group also demonstrated considerable impairment, particularly in school and social domains, although to a lesser extent than the PMDD group.

• The No/Mild PMS group consistently reported low percentages across both symptoms and impairments, indicating minimal disruption in daily life.

This visualization underscores the progressive severity of PMS symptoms and related dysfunctions, highlighting the profound impact of PMDD on multiple aspects of personal, academic, and social functioning.

Discussion

Premenstrual Dysphoric Disorder (PMDD), now recognized as a distinct depressive disorder in the DSM-5, represents the severe end of the premenstrual syndrome (PMS) spectrum, with specific

diagnostic criteria.[22] This study, conducted among female medical students, revealed a relatively high level of awareness about PMDD, which is notable given the limited existing literature on the subject. A prior study in Pakistan reported that only 19% of female medical students had prior knowledge of PMDD.[23]

Interestingly, our findings showed that students in their clinical years—regardless of gender—demonstrated greater awareness of PMDD. This is likely due to increased exposure to relevant content in the medical curriculum. Additionally, female students with a history of mental or physical health conditions, as well as those who screened positive for PMDD, were more likely to be aware of the disorder.[24] However, a concerning finding was that more than half of the participants expressed hesitance or disinterest in seeking or recommending medical attention for PMDD symptoms, whether for themselves or for close friends and relatives. This highlights a potential negative attitude toward PMDD, possibly driven by the stigma surrounding mental health or a general underestimation of the condition's severity.[25]

In terms of prevalence, this study found that among the 173 participants:

- **8.67% met the criteria for PMDD**,
- **44% reported moderate to severe PMS**, and
- **47% experienced no or only mild PMS symptoms**.

These results align closely with global PMDD prevalence estimates, which range from 3% to 9%. A similar study conducted in Jordan reported a slightly higher PMDD prevalence of 10.2%.[26] Other studies have reported even higher rates, between 20.4% and 36.6%. These discrepancies may be attributed to differences in sampling methods, population demographics, or the screening tools employed. Our study, for instance, focused exclusively on medical students with a mean age of approximately 21 years, which could contribute to the variation.

Conclusion

This study identified a prevalence rate of 8.67% for Premenstrual Dysphoric Disorder (PMDD) among female medical students, aligning with global prevalence estimates. A significant association between PMDD and dysmenorrhea was observed, highlighting the need for comprehensive assessment in individuals reporting severe menstrual pain.

Additionally, the study revealed a higher level of PMDD awareness among female students compared to their male counterparts, suggesting that gender and medical training phase may influence awareness levels. Despite this, a considerable number of participants still expressed reluctance to seek medical management, underscoring persistent stigma or underestimation of PMDD's severity.

Future research should aim to explore the influence of reproductive characteristics on PMDD and expand the assessment of PMDD awareness among both healthcare providers and the general population. Moreover, prospective, longitudinal studies are essential to more accurately determine the prevalence and clinical trajectory of PMDD. A deeper investigation into its etiology and overlap with PMS and other mood disorders will contribute to more effective diagnosis, treatment, and support for affected individuals.

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SECTION I: Participant Demographics (Revised Version – Female Respondents Only)

Table 1: Personal and Academic Information

No.	Variable	Options
1	Current Age	Under 21 / 21–23 / 24 and above
2	Year in Medical School	Year 3 / Year 4 / Year 5 / Final Year
3	Residential Status	Independent / With guardians
4	Marital Condition	Unmarried / Engaged / Married / Divorced / Widowed
5	Children	Yes / No
6	Previous Pregnancies	Enter count
7	Body Weight (in kg)	
8	Body Height (in cm)	
9	Tobacco Use	Yes / No
10	Alcohol Intake	Yes / No
11	Use of Birth Control Methods	Yes / No
12	Currently on Prescription Medication	Yes / No
13	If yes, specify medications	
14	Mental Health History	Yes / No
15	If yes, specify diagnosis	
16	Any other diagnosed health conditions	Yes / No
17	If yes, specify diagnosis	

Table 2: Awareness Assessment

No.	Question	Yes	No	Unsure
1	Are you aware of mood alterations that might occur during the menstrual cycle?			
2	Can dietary habits shift before or around menstruation?			
3	Can sleep quantity or quality vary across the menstrual period?			
4	Do women sometimes prefer isolation during premenstrual days?			
5	Is productivity ever influenced during menstruation?			
6	Are there instances where menstrual symptoms severely hinder functioning?			
7	Is there a medical term for significant cyclical emotional and physical symptoms?			
8	Have you heard of PMDD (Premenstrual Dysphoric Disorder)?			
9	Would you consider professional care for these symptoms in yourself or a peer?			

Table 3: Menstrual History and Reproductive Characteristics

No.	Question	Options
1	Age at first menstruation	≤12 / 13–14 / 15–16 / ≥17
2	Usual menstrual cycle length (in days)	≤20 / 21–26 / 27–31 / ≥32
3	Is your cycle regular?	Consistently Regular / Often Irregular
4	Duration of menstrual bleeding (in days)	1–3 / 4–6 / 7–9 / >9
5	Intensity of menstrual flow	Light / Mild / Moderate / Intense
6	Do you suffer from menstrual cramps (dysmenorrhea)?	Yes / No
7	Severity of cramps (if applicable)	Not Applicable / Mild / Moderate / Severe

Table 5: Symptom Evaluation – Premenstrual Screening Tool (PMST) *Instructions*: **Please indicate the degree to which you experience each symptom before your period starts and how they impact your activities.**

Symptom	None	Mild	Moderate	Severe
Irritability or anger				
Anxiety or heightened nervousness				
Emotional sensitivity (e.g., tearfulness)				
Depressed or low mood				
Disinterest in school/work responsibilities				
Disinterest in home duties				
Avoidance of social interaction				
Trouble focusing				
Feeling tired or low on energy				
Changes in appetite (including cravings)				
Trouble falling or staying asleep				
Sleeping more than usual				
Overwhelmed or emotionally unstable feelings				
Physical complaints (e.g., sore breasts, joint pain, bloating)				

Functioning Impact Assessment

Activity Affected by Symptoms	None	Mild	Moderate	Severe
Academic or work performance				
Interaction with colleagues/peers				
Communication with family members				
Social events and gatherings				
Managing household responsibilities				