RESEARCH ARTICLE

# A LONGITUDINAL STUDY ON PREMENSTRUAL DISORDERS AMONG FEMALE MEDICAL STUDENTS OF A TERTIARY-CARE HOSPITAL

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**ABSTRACT**
**Background**: Premenstrual disorders (PMDs) are a debilitating group of conditions that remit on onset or immediately after menstruation, causing social and occupational impairment in the lives of affected women. PMDs consist of premenstrual syndrome (PMS) and premenstrual dysphoric disorder (PMDD). With the lack of awareness of PMDs in young girls, they are often neglected not only by the students but also by their parents and teachers.
**Aims and Objectives**: To find the prevalence of PMS and PMDD in undergraduate medical students; to find out the severity of premenstrual symptoms; and to find out the impact of PMDs on students.
**Materials and Methods**: A descriptive, longitudinal study was carried out at Pravara Institute of Medical Sciences (PIMS), Loni, Maharashtra, India, on students of medical faculty for 3 months in which 220 female subjects were selected according to inclusion and exclusion criteria. Self-structured, pretested premenstrual disorder symptoms questionnaire was given for charting occurrence and severity of symptoms for two consecutive cycles.
**Results**: Of 220 students, 94 (42.8%) had PMDs: 49 (20.5%) with PMS and 45 (22.3%) with PMDD. Behavioral symptom irritability [51 (54.25%)] was the most commonly occurring severe premenstrual symptom. In the PMD group, 58 (61.70%) reported a marked effect of premenstrual symptoms on their studies and 37 (39.36%) missed out on lectures.
**Conclusion**: The severe forms of PMDs are high in this study setup, and despite awareness they significantly affect academics and daily functioning of medical students.
**Key Words:** Premenstrual Disorders; Premenstrual Syndrome; Premenstrual Dysphoric Disorder; Medical Students

## Introduction

Many women of reproductive age group experience a variety of symptoms related to the menstrual cycle that may be limited to mild discomfort or extend to premenstrual syndrome (PMS) or to the most severe premenstrual dysphoric disorder (PMDD). PMS is a common disorder of young and middle-aged women characterized by cyclic occurrence in the luteal phase of the menstrual cycle of a combination of distressing physical, psychological, and behavioral changes of sufficient severity to result in deterioration of interpersonal relationships and/or interference with normal activities, which remit upon onset or immediately after menstruation. Women with more severe affective symptoms are classified as having PMDD.[1]

Despite increasing attention and awareness of premenstrual disorders (PMDs), they are notoriously underrecognized and availability of conventional therapy is sparse and controversial. Approximately 70–90% of women of childbearing age experience at least some uncomfortable symptoms during the premenstrual phase of their cycles.[2]

Most of the studies on PMS were conducted in the West, with very few data available on Asian women, in whom the pattern of symptoms may differ from those in Western women. We carried out this study because, PMS being a disease of young generation there are few studies among young Indian women, who make up a substantial proportion of India's female population.[3]

## Materials and Methods

A descriptive type of longitudinal study was carried out at Pravara Institute of Medical Sciences (PIMS), Loni, Maharashtra, India, for 3 months among female students of medical faculty in Rural Medical College. Minimum sample size of 196 was estimated using the following formula: $n = Z^2_{(1-\alpha/2)}P(1-P)/d^2$,[4] where $n$ is the sample size; $P$ (85%) is the prevalence that been taken from the previous studies;[5] $Z$ (1.96) is the statistic for a level of confidence, at 95%CL; and $d$ (0.05) is the absolute precision. Systematic random sampling was used for data collection. For sampling interval, SI = $N/n$, where, $N$ (600) is the number of female students in PIMS and $n$ (196) is the calculated sample size. Therefore, every third student from the college was screened for the study.

Subjects giving history of any condition that presents with similar symptoms like PMDs were excluded such as endometriosis, anemia, hypothyroidism, diabetes mellitus, anorexia, bulimia, any psychiatric illness and affective disorders, substance abuse disorder, and use of oral contraceptive pills or intrauterine device. Unmarried female students of medical faculty with history of regular menstrual cycle for last 6 months were included in the study.

The permission of institutional ethics committee and consent of participants were taken before starting the study. A pilot study was also carried out for validation, practicality, and applicability of questionnaire.

The aims and objectives of the study were explained to the participants before filling their demographic profile and a pretested, self-structured premenstrual disorder symptoms questionnaire. The participants were given the premenstrual disorder symptoms questionnaire and were told to mark the occurrence and access the symptoms into mild, moderate, and severe based on the experience of the past 7 days starting from the day of menstruation. Visits were made to the students twice a month to clear any doubts regarding the questionnaire. The questionnaire was collected at the end of two cycles or at the beginning of third cycle. This was done to felicitate participant compliance.



Because premenstrual symptoms peak in severity 5–10 days before the onset of menses, subside during the menstrual week, and are generally absent during the postmenstrual week, we focused our analysis on the assessment of the premenstrual week and the menstrual week. The symptoms were categorized as physical, psychological, and behavioral.

For preparation of the premenstrual disorder symptoms questionnaire, Prospective Record of the Impact and Severity of Menstrual Symptoms (PRISM) and Moos Menstrual Distress Questionnaire (MDQ) were considered. The patients with PMS were diagnosed according to the American College of Obstetricians and Gynecologists criteria and those with PMDD diagnosed according to the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* criteria.[6,7] The questionnaire was checked for completeness. Statistical Package for the Social Sciences (SPSS) software, version 21 (SPSS Inc., Chicago, IL) was used for descriptive and inferential statistics.

## Results

A total of 220 students participated in this study (mean age, 20.48 ± 2.48 years; mean age of menarche, 13.24 ± 1.34 years; and mean average no. of days of menstrual bleeding, 4.78 ± 1.20 days). Mean number of pads used during single menstruation cycle was 3.25.

**Table-1: Distribution of the participants (n = 220)**

| Groups | No. of participants |
|---|---|
| Normal | 126 (57.2%) |
| PMS | 49 (22.3%) |
| PMDD | 45 (20.5%) |
| Total | 220 (100%) |

**Table-2: Comparison of symptoms between healthy group and group suggestive of PMDs**

| Symptoms | Normal (*n* = 126) | PMD (*n* = 94) | Statistical test |
|---|---|---|---|
| **Physical** | | | |
| Acne | 6 (4.76%) | 37 (39.36%) | Fisher's exact test, $p < 0.0001$ extremely significant |
| Muscle/joint/ back pain | 17 (13.49%) | 50 (53.19%) | Fisher's exact test, $p < 0.0001$ extremely significant |
| **Psychological** | | | |
| Depressed mood/ hopelessness | 4 (3.17%) | 37 (39.36%) | $\chi^2 = 44.19$, df = 1, $p < 0.001$ extremely significant |
| Tension/ anxiety | 6 (4.76%) | 23 (24.46%) | $\chi^2 = 16.58$, df = 1, $p < 0.001$ extremely significant |
| Sudden mood changes | 0 | 42 (44.68%) | Fisher's exact test, $p < 0.0001$ extremely significant |
| **Behavioral** | | | |
| Irritability | 6 (4.76%) | 51 (54.25%) | $\chi^2 = 66.145$, df = 1, $p < 0.001$ extremely significant |
| Angry outbursts | 3 (2.38%) | 26 (27.65%) | $\chi^2 = 27.89$, df = 1, $p < 0.001$ extremely significant |

**Table-3: Impact of premenstrual symptoms on students**

| Impact | Healthy (*n* = 126) | PMD (*n* = 94) | Statistical test |
|---|---|---|---|
| Negative effect on academics | 10 (12.6%) | 58 (61.70%) | $\chi^2 = 70.379$, df = 1, $p < 0.001$ extremely significant |
| Absent from class | 7 (5.55%) | 37 (39.36%) | $\chi^2 = 36.3711$, df = 1, $p < 0.001$ extremely significant |
| Marked decrease of interest in usual activities | 0 | 27 (28.72%) | Fisher's exact test, $p < 0.0001$ extremely significant |
| Marked interference with work, relationships | 0 | 22 (23.40%) | Fisher's exact test, $p < 0.0001$ extremely significant |

Of the 220 participants, 94 (42.8%) were diagnosed with PMDs. Among the PMD group, 49 (22.3%) had PMS and 45 (20.5%) had PMDD [Table 1].

The moderate-to-severe symptoms reported by each student were considered together as marked. Among the PMD group, 37 (39.36%) had marked acne; 50 (53.19%) muscle/joint/back pain; 37 (39.36%) depression/feeling of hopelessness; 23 (24.46%) tension/anxiety; 42 (44.68%) sudden mood changes; 26 (27.65%) angry outbursts; and 51 (54.25%) irritability, which was also the most commonly occurring symptom.

The comparison of symptoms was done between two groups. In the PMD group, 50 of 94 subjects and in normal group only 17 of 126 had reported physical symptoms, namely muscle/joint/back pain. On the application of Fisher's exact test, the difference between the two was found extremely significant ($p < 0.0001$). Sudden mood change was the most common psychological symptom. In the PMD group, 42 of 94 and none in the normal group suffered from this symptom. This difference was found significant on the application of Fisher's exact test ($p < 0.0001$). Among behavioral symptoms, irritability was the most common. In the PMD group, 51 of 94 and in normal group only 6 of 126 had marked irritability. On the application of $\chi^2$-test, the difference was found to be extremely significant ($\chi^2 = 66.145$, df = 1, $p < 0.001$; Table 2).

In normal group, 10 of 126 and in the PMD group 58 of 94 reported negative effects of premenstrual symptoms on their studies [Table 3]. This difference was found to be extremely significant on applying $\chi^2$-test ($\chi^2 = 70.379$, df = 1, $p < 0.001$). In normal group, 7 of 126 group and in the PMD group 37 of 94 remained absent from class due to premenstrual symptoms, and the difference was found to be extremely significant on applying $\chi^2$-test ($\chi^2 = 36.3711$, df = 1, $p < 0.001$). In the PMD group, 27 (28.7%) had marked decrease in usual activity and 22 (23.4%) had marked interference with work and relationships.

About 71.4% of the participants had a fair idea regarding PMS and its symptoms; 11.4% consulted a physician, 8.6% took medications, and 23.2% consulted family and friends for PMS; and 29.5% answered they neglected PMS.

Because of the interpersonal detailed education proportion of delayed dose, significant reduction was observed from 42% (November 2012) to 26% (January 2013) ($Z = 2.96$, $p < 0.05$). Compliance to the ARV schedule was also found to significantly improve from 58% (November 2012) to 74% (January 2013) ($Z = 3.03$, $p < 0.05$).

## Discussion

Compared with our study, a higher rate of PMDs (71.2%), that is, 53% of PMS and 18.2% of PMDD, was reported by Tabassum *et al*..[8] A lower incidence of PMDs (34.9%), that is, 32.1% of PMS and 2.8% of PMDD, was estimated by Choi *et al*.[9] The cause for such difference may be due to varied definitions, methods of data collection, sampling technique, and the type of study population. The prevalence of PMDD was significantly higher in studies conducted on medical students (20.5%) as compared to those conducted on general population (2.8%). This is possibly because of relatively more stress factors among medical students.

In our study, most commonly occurring severe symptom was behavioral, that is, irritability (54.25%). Tabassum *et al*.[8] reported psychological symptom anxiety (94.64%) as the most common and severe symptom. In the Korean study, most prevalent were physical symptoms such as back/muscle/joint pain and lower abdominal pain.

Our study showed that 61.7% suffered in academics and 39.36% missed out on lectures due to PMDs. This was in accordance with the study by Balaha *et al*.[10] (King Faisal University, Saudi Arabia) who reported 48.3% could not concentrate in class and 46% could not attend lectures due to PMDs.

In this study, 28.6% of the medical students had no knowledge regarding PMS and PMDD. This figure increased to an alarming 91.5% when conducted in general population (Choi *et al*.[9]). Also, only 11.4% consulted a physician and 8.6% took medications. This was in accordance to only 10.7% seeking treatment from a physician as reported by Choi *et al*.[9] Therefore even though medical students have a fair idea regarding PMDs, they infrequently consult a physician.

## Conclusion

The study concluded that PMDs are a common uncared-for problem among the young population that have a significant impact on their daily functioning and often go undiagnosed for years. The findings from this study adds to the database on the available prevalence studies on PMDs and might be useful for planning of health care for young women, especially in India.

### Recommendations

Students suffering from psychological and behavioral problems should be sent to a councillor, and those with physical symptoms pertaining to pain should be given physiotherapy. In addition, there is need to establish and strengthen school-based reproductive health education programs to spread awareness to enable female students to learn how to deal with these disturbing problems early on. Further research should be carried out to establish the etiology of PMDs.

### Limitations

Our study included a highly selective sample comprising of medical students from one academic institute, which will limit the generalization of the findings. The questionnaire filling is likely to pose some bias during recall of symptoms.

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