Subjective Sleep Problems in Young Women Suffering from Premenstrual Dysorphic Disorder

Premenstrual syndrome (PMS) is a common disorder that affects nearly 9–72% women across studies.[1-3] Premenstrual dysorphic disorder (PMDD) is the more severe form of the PMS and its prevalence ranges between 3% and 30%.[2,4] Sleep problems form an integral part of the problem as they are included in the diagnostic criteria for PMDD.[5] A number of studies have tried to find association between PMS or PMDD with sleep pattern and quality of sleep in the past. Sleep was examined using subjective as well as objective measures.[6-10] Majority of the studies have recorded sleep using a polysomnograph across various phases of menstrual cycle.[6-10] However, many of the patients experience first-night effect while sleeping in a sleep laboratory and this may adversely affect polysomnographic data.[11,12] Subjective perception of sleep-related parameters may not match the objective data, and resultantly the patient often complains of subjectively poor-quality sleep despite a good sleep on polysomnograph.[13] The common example is the paradoxical insomnia. Subjective perception of sleep which affects the clinical picture to a greater extent was examined by only a handful of these studies.[6-10] Though as scientists we rely more on objective evidences, still the subjective parameters cannot be overlooked as they are stronger determinants of quality of life. Hence, the present study was planned to assess subjective sleep problems in PMDD subjects and to compare them with the non-PMDD group. We further hypothesized that subjective sleep parameters would also affect the daytime functioning.

This questionnaire-based study was done in a nursing college after seeking approval of the institutional ethics committee and permission of college administration. All the female students were invited to participate in the study. Female teachers who took the responsibility to get the questionnaires filled were explained the purpose of the study beforehand. They were also explained what kind of information was intended from each question in a training session. The questionnaire was distributed among the girls with the help of female teachers. Hence, the authors were blinded regarding the identity of participants. This blinding helped to motivate the participants. Teachers then explained the purpose of study to all students and encouraged them to volunteer the information.

Verbal informed consent was taken from the participants and those who were not interested in participating in the study were excluded. The girls who were taking any kind of psychotropic drug or hormonal therapy were also advised not to participate in this study.

The survey questionnaire was designed in Hindi language. It contained instructions regarding intended information. First part of the questionnaire contained instructions and the exclusion criteria as mentioned above. The next part contained questions regarding participants’ demographic data and changes observed in their sleep patterns prior to 1 week of onset of menstruation as compared to other days of the month during past 3 months. These questions included: “change in total sleep time” (responses were increased, as usual, decreased); “time to bed” (advanced, as usual, or delayed); “quality of sleep” (poor, as usual, better); etc. Subjects were supposed to choose the response that best described their condition.

Screening for the PMDD was based upon DSM-IV-TR criteria.[5] The question was as follows: “Did you notice any change in your mood (depressed, as usual, better) 1 week prior to onset of your menstruation as compared to other days of the month?” Similar questions were asked regarding other symptoms e.g. irritability (increased, as usual, worse); ability to concentrate (better, as usual, poor) etc.” In this manner, all the 11 criteria mentioned in DSM-IV-TR were changed in the question form. Subjects responded by marking the option that best explained their condition on that item. As per the DSM-IV-TR criteria, subjects who fulfilled 5 of the 11 criteria with at least 1 from the first 4 criteria during past 3 months were considered PMDD. However, DSM requires prospective charting of symptoms for the diagnosis of PMDD; hence, these cases were termed as possible-PMDD.

Students were provided explanation if they had any difficulty in understanding the meaning of any of the items. The questionnaires were then collected and analyzed.

Statistical analysis was done with the help of SPSS version 17.0. Cohort was divided into two groups – those with PMDD and those not fulfilling the criteria of PMDD. Chi-square test was used to compare non-parametric variables.
The study sample consisted of 269 subjects. The average age of students was 19.06 years (±1.56 years). 37.5% students met the criteria for possible-PMDD.

Possible-PMDD subjects reported that their sleep quality was worse before the onset of their menstruation, as compared to subjects who did not fulfill the criteria for PMDD. Table 1 depicts the other details of sleep-related variables.

Possible-PMDD group complained of fatigue during the day ($\chi^2 = 36.68$, df = 3, $P < 0.001$) and daytime sleepiness ($\chi^2 = 18.16$, df = 3, $P < 0.001$).

Our study found that possible-PMDD group had poor sleep as compared to non-PMDD group on several measures of sleep including bed time, sleep quality, sleep-onset latency, sleep maintenance, and wake time. Similarly, daytime fatigue and daytime sleepiness was also reported by possible-PMDD group. This is in concordance with the results of earlier studies. Mauri et al.\[10\] have reported that women with severe PMS complain of increased sleepiness and fatigue before menstruation as compared to other periods of their own menstrual cycle as well as with reference to the control group. An increase in daytime sleepiness was the only factor that was able to differentiate between women with and without PMS in another study.\[14\] Severe PMS has been known to worsen the sleep quality, increase the daytime sleepiness, and is associated with reduced alertness during the day.\[9\] Thus, these studies reported that the fatigue, sleepiness, and alertness during the day may be used to differentiate PMDD group from non-PMDD group. However, unlike the present study, these studies failed to find any difference in nocturnal sleep. This association between PMS and disturbed subjective sleep parameters (increased nocturnal awakenings, unpleasant dreams, delayed wake time, and morning tiredness) was reported by only one study which was conducted long back.\[10\] As the quest for the objectivity has increased, most of the work in this area during past decade was done using objective parameters, which may not find any difference despite subjective symptoms.\[15\] Thus, as a clinician, it is important to consider patients’ symptoms rather than just look for the laboratory reports. Further, as a scientist, these results

### Table 1: Comparison of sleep-related variables between possible-PMDD and no PMDD groups

| Subjective sleep parameters evaluated | Possible-PMDD+ (%) | PMDD− (%) | $\chi^2$ | df | $P$ |
|---------------------------------------|-------------------|-----------|----------|----|-----|
| Sleep quality                         |                   |           |          |    |     |
| Better                                | 7.9               | 7.1       | 11.26    | 2  | 0.004 |
| As usual                              | 71.3              | 85.8      |          |    |     |
| Worse                                 | 20.8              | 7.1       |          |    |     |
| Time to bed                           |                   |           |          |    |     |
| As usual                              | 43.6              | 76.2      | 35.53    | 2  | <0.001 |
| Earlier                               | 35.6              | 8.9       |          |    |     |
| Later                                 | 20.8              | 14.9      |          |    |     |
| Sleep-onset latency                   |                   |           |          |    |     |
| Increased                             | 32.7              | 15.5      | 15.49    | 2  | <0.001 |
| As usual                              | 47.5              | 70.8      |          |    |     |
| Decreased                             | 19.8              | 13.7      |          |    |     |
| Sleep maintenance                     |                   |           |          |    |     |
| Better                                | 5                 | 5.4       | 21.16    | 2  | <0.001 |
| As usual                              | 66.3              | 86.8      |          |    |     |
| Worse                                 | 28.7              | 7.7       |          |    |     |
| Nocturnal awakenings                  |                   |           |          |    |     |
| Increased                             | 26.7              | 10.1      | 13.98    | 2  | 0.001 |
| As usual                              | 55.4              | 61.3      |          |    |     |
| Decreased                             | 17.8              | 28.3      |          |    |     |
| Wake time                             |                   |           |          |    |     |
| As usual                              | 42.6              | 72.6      | 29.95    | 2  | <0.001 |
| Advanced                              | 39.6              | 22        |          |    |     |
| Delayed                               | 17.8              | 5.4       |          |    |     |
promote us to search for the factors that are responsible for the difference between subjective and objective quality of sleep in this specialized group.

We also found an increased frequency of daytime symptoms in possible PMDD group, which could have been an influence of nocturnal sleep. Considering the example of paradoxical insomnia, in future, it will be interesting to examine the relationship between PMDD, subjective sleep quality, objective sleep parameters, and daytime symptoms. This may guide us in the management of PMDD.

We would like to mention that in this study, subjects without possible PMDD also reported sleep problems. This suggests that sleep problems are not governed by PMDD; rather, they are related to menstrual cycle. In the past, one study reported that poor sleep quality was seen not only in PMDD group but also among non-PMDD women; however, other factors remained unaffected.[6] Manber et al.[14] also reported that sleep disturbance, e.g. increased sleep latency, reduced sleep efficiency, and poor sleep quality, was not limited to PMS group; rather, it was found in all women before menstruation. One reason for these results could be fluctuation in plasma melatonin level and sleep–wake rhythms across menstrual cycle, even in healthy females.[7] These evidences suggest that poor sleep could be a trait marker of premenstrual period rather than a state marker of PMS or PMDD. In other words, sleep changes may be an inherent property of menstrual cycle and PMDD sufferers could have an exaggeration of sleep-related problems during late luteal phase. Like any other study, this study also had some methodological limitations. First, it was a survey and questionnaire can be used to screen only. Secondly, surveys are always associated with recall bias. Thirdly, DSM-IV-TR suggests that PMDD should be diagnosed prospectively, which was not done in the present study. Nonetheless, this study shows important findings in this area and is probably the first Indian study to address this important but yet unrecognized issue. In addition, this study adds up to the scarcely available literature that has this important but yet unrecognized issue. In addition, this study also had some methodological limitations. First, it was a survey and questionnaire can be used to screen only. Secondly, surveys are always associated with recall bias. Thirdly, DSM-IV-TR suggests that PMDD should be diagnosed prospectively, which was not done in the present study. Nonetheless, this study shows important findings in this area and is probably the first Indian study to address this important but yet unrecognized issue. In addition, this study adds up to the scarcely available literature that has this important but yet unrecognized issue.

In conclusion, possible-PMDD sufferers have problems with their night sleep and also bear daytime symptoms. These symptoms negatively affect their ability to accomplish daily chores.

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