Prevalence of premenstrual dysphoric disorder among school-going adolescent girls

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Abstract

Background: Premenstrual dysphoric disorder (PMDD) is a severe form of premenstrual syndrome which has a significant negative impact on the various domains of life of adolescent girls. Aim: The aim of this study was to estimate the prevalence of PMDD in adolescent girls studying in classes 7th–10th and ascertain the level of stress, anxiety, and depression among them. Methodology: A cross-sectional study was conducted in three all-girls schools in Chandigarh (two – government and one – private) after taking necessary permissions. Participants were evaluated on a self-rated questionnaire which included the PMDD scale, Perceived Stress Scale, Generalized Anxiety Disorder-7 (GAD-7) questionnaire, and Patient Health Questionnaire-9. Results: A total of 397 girls participated in the study. The mean age of respondents was 14.34 (standard deviation [SD]: 1.17; range: 11–20) years, with most (44%) studying in class 10th. The mean age of attaining menarche was 12.54 (SD: 0.92; range: 10–15) years. The prevalence of PMDD was found to be 4.8% (n = 19). Majority of the respondents reported moderate levels of perceived stress (62%). A positive correlation was seen between the severity of PMDD, age, levels of perceived stress, severity of depression, and anxiety in the respondents. Conclusion: Nearly 5% of adolescent girls suffer from PMDD, with higher prevalence among those with depression, GAD, and higher perceived stress. Thus, there is a need to screen adolescent females for PMDD at the earliest and institute intervention to minimize its negative impact.

Keywords: Depression, premenstrual dysphoric disorder, premenstrual syndrome, stress

Premenstrual syndrome (PMS) is understood as recurrent psychological and/or physical symptoms occurring during the luteal phase (i.e., 1–2 weeks before period) of the menstrual cycle, which often resolve by the end of menstruation. For some of the sufferers, the symptoms are severe enough to interfere with their lives. A severe form of PMS includes premenstrual dysphoric disorder (PMDD) which is characterized by psychological symptoms in the form of irritable mood, depression/sadness, emotional lability, anxiety, and somatic symptoms in the form of mastalgia, headache, edema, weight gain, syncope, and paresthesia. PMDD can have a negative impact on functioning in various domains of life.[¹]

Available studies from different parts of the world have reported a wide range of prevalence of PMS. A systematic review and meta-analysis of the studies from different parts of the world reported a pooled prevalence of PMS to be 47.8%, with a range of 12%–98%.² The prevalence rates for PMDD in women of reproductive age group range from 3% to 8%.³
Many studies from India have also evaluated the prevalence of PMS and PMDD. However, most of these studies have relied upon the use of self-designed questionnaires, which have not been validated adequately. In recent times, some of the studies have used scales such as Premenstrual Symptoms Screening Tool (PSST) and PSST for Adolescents. The prevalence of PMS in various studies ranges from 14.7% to 91.4% and the prevalence of PMDD has ranged from 3.7% to 39%. Majority of the studies which have reported the prevalence of PMS suggest the same to be of mild severity. Some of the studies have included females aged 18 and beyond, although some of the studies have included adolescent girls, as young as 10 years.

Available data suggest that the prevalence and severity of depression and anxiety are significantly higher among patients with PMDD and PMS. However, only occasional studies have explored this relationship. One study evaluated the relationship of depression and PMDD and reported a higher prevalence of PMDD among those with depression. None of the studies from India have evaluated the relationship of PMDD with anxiety and stress. Accordingly, there is a need to expand the data on PMDD in adolescent girls from India. In this background, this study aimed to estimate the prevalence of PMDD in adolescent girls studying in classes 7th–10th and ascertain the level of stress, anxiety, and depression among them.

**METHODOLOGY**

This was a cross-sectional study conducted in Chandigarh. The study was approved by the ethics committee of the institute. The study population included adolescent girls studying in class 7th–10th, studying either in government or private schools. At the time of the study, there were about 72,172 adolescent girls enrolled in government and private schools in Chandigarh. There were 197 schools in Chandigarh at the time of the study, of which two were government and three were private all-girls schools. Hence, both government schools and one all-girls private school were selected. Students from class 11th could not be involved as their session began in July (later than the other classes) and class 12th was excluded to reduce the bias as it is considered a stressful period. Permission was sought from the respective school principals for conducting the study. Appropriate information was given to Direct School Education, District Education Officer, and Mission Director, National Health Mission. Written assent forms were obtained from the participants. The participants were explained about the purpose of the study. Participation in the study was voluntary. All the information regarding the participants was kept confidential.

To be included in the study, the participants were required to be studying in class 7th–10th, attained menarche at least 1 year back, having regular menstrual cycle, and willing to participate. Those adolescent girls, those who had not attained the menarche, those on treatment for any illness, and those not willing to participate were excluded. Data were collected during the school hours, each class at a time by one person only. After explaining the purpose of the study, a self-rated questionnaire was given to the participants during the academic session 2016–2017.

The questionnaire included a pretested structured questionnaire, which had the provision of collecting information on the background of the participant, PMDD scale, Perceived Stress Scale, Generalized Anxiety Disorder-7 (GAD-7) questionnaire, and Patient Health Questionnaire (PHQ-9). The Hindi versions of the GAD-7 and PHQ-9 have been widely used earlier. The participants were required to give a retrospective (or current) account of experience of symptoms during the previous menstrual cycle.

PMDD scale comprises 12 items, anchored around the 11 diagnostic criteria in the Diagnostic and Statistical Manual of Mental Disorders, fourth revision (DSM-IV) criteria. One of the DSM-IV criteria hypersonia/insomnia is divided into 2 items in this scale. Each item is rated on a four-point scale (not at all to severe rated as 0–4). The scales evaluate a list of symptoms, listed as part of section A of the scale, and impact of the symptoms is evaluated in four domains of life, as part of section B of the scale. The symptoms should appear 1–2 weeks before the start of menstrual flow and resolve within 2–3 days of menstruation in majority of the menstrual cycles during the past 1 year. Diagnosis of PMDD is considered if the participant rates one of the first 4 items, i.e., depressed mood, anxiety, tearfulness, and anger as “severe” and at least 4 of the items rated as “moderate to severe,” along with rating of “severe,” for one of the items from section B.

The data were entered and analyzed using the Statistical Package of the Social Sciences 21 version (SPSS version 21; IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.). Frequency and percentages were calculated for the categorical variables, and mean and standard deviation (SD) were calculated for the continuous variables.

**RESULTS**

A total of 397 schoolgirls filled the prestructured questionnaire. The mean age of the respondents was 14.34 (SD: 1.17; range: 11–20) years, with 31% of the
respondents aged 15 years, followed by 30.5% of the respondents aged 14 years. About two-third (63.2%) of the girls were studying in the government schools and the remaining were from the private schools. In terms of class, 44% of the respondents were studying in class 10th, followed by around 40% studying in class 9th, 13% in class 8th, and only 3% in class 7th. The mean age of attaining menarche was 12.54 (SD: 0.92; range: 1–015) years, with 39% of the girls attaining menarche at 12 years of age, followed by 13 years of age (37%), 14 years (11%), 11 years (10%), and least at 10 years of age (around 1%). About three-fourth (77%) of the respondents followed Hindu religion, followed by almost equal numbers of participants following Sikhism and Islam (10%) and a small proportion (3%) belonging to other religions.

More than half (61.5%) of the participants were aware about menstruation before attaining menarche, with mothers being the primary source of information in 30.5% of them. For others, the sources of information were friends (14.1%), teachers (10.1%), sisters (5.8%), and others (1%). Half (51.1%) of the respondents were aware of the cause of menstruation as being a physiological cause, whereas 43.3% did not know the cause and 5.5% of the respondents considered it to be a curse of God. Half (49.9%) of the respondents were unaware of the source of discharge of menstrual blood, whereas 30.7% considered it to be from the urethra and only 19.4% of the respondents were aware of the fact that the source of menstrual follow was uterus/vagina. In terms of symptoms of PMS, 32.7% of the respondents reported discomfort a few days prior, and during their menstrual flow, 50.9% of the respondents reported discomfort during the menstrual flow and only 16.4% of the participants reported no discomfort. Among those who reported discomfort associated with the menstrual flow, the mean duration of discomfort was 3.35 (SD: 1.7) days, with about one-fourth (27%) reporting discomfort for 2 days, and this was followed by discomfort for 3 days (20.8%), 4 days (15.4%), 5 days (14.5%), 1 day (11.3%), and more than 5 days (10.9%). In terms of the most distressing days, nearly half (47.9%) of the respondents reported it to be on day 1 of the flow. About one-seventh (14.4%) of the participants reported taking some medications to get rid of the discomfort. Other measures which were used to deal with the discomfort included lying down in supine position (30%), cold bath (12%), exercises (10%), and hot fomentation (8%). More than one-fourth (40%) of the participants reported living through the pain. Around three-fourth (77.3%) of the respondents did not miss school during menstruation, and of those missing, two-third (66.3%) stated pain as the main cause for missing the school. Nearly half (46%) of the respondents believed that periods affect school work. In terms of specific impact among those who reported school work getting affected, 39% reported difficulty in concentrating, 23% felt irritable or arguable, 21% could not participate in cocurricular activities, and 13% reported difficulty in coping with the homework.

The prevalence of PMDD in the present study was found to be 4.8% (n = 19). The mean symptom score for the study sample was 11.87 (SD: 7.17), with a range of 0–33. In terms of perceived stress, 24 (6%) participants reported high perceived stress (PSS total score >26) and 62% (n = 246) reported moderate levels of stress (PSS score of 14–26). The mean PHQ-9 score for the study sample was 16.44 (SD: 6.36). The mean GAD-7 score for the study sample was 6.21 (4.86), with a range of 0–32, and 78 (19.6%) participants scored above 10, which is considered to be cutoff for moderate depression. The mean GAD-7 score for the study sample was 4.89 (SD: 4.89), and 66 (16.6%) of the participants had score in the moderate (i.e., ≥10) range or beyond.

As shown in Table 1, the higher severity of PMDD symptoms was associated with higher severity of stress, anxiety, and depression. In addition, there was a positive correlation between severity of PMDD and age.

When the prevalence of PMDD was evaluated in those with at least moderate level of depression, anxiety, and stress, it was seen that the prevalence of PMDD was significantly higher among those with depression, anxiety, and stress [Table 2].

**DISCUSSION**

The present study aimed to evaluate the prevalence of PMDD among school-going girls, using a standardized scale, which is based on DSM-IV criteria for PMDD. The study shows that the prevalence of PMDD among school-going girls was found to be 4.8% (n = 19). When one evaluates this prevalence in light of the existing literature involving females of different age groups, our prevalence

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**Table 1: Relationship of severity of premenstrual dysphoric disorder symptoms with stress, depression, and anxiety**

| Variable          | Age     | PSS scale | PHQ-9     | GAD-7     |
|-------------------|---------|-----------|-----------|-----------|
| PMDD screening tool | 0.119 (0.018) * | 0.509 (<0.001)** | 0.522 (<0.001)** | 0.534 (<0.001)** |

PMDD – Premenstrual dysphoric disorder; PSS – Premenstrual Symptoms Screening; PHQ – Patient Health Questionnaire; GAD – Generalized Anxiety Disorder
As depression in adolescence can be an initial manifestation of underlying bipolarity, it can be said that the findings of the present study also provides support to the association of PMDD with affective disorders.

The present study has certain limitations. These include cross-sectional assessment and restriction of the study to school-going girls. It is possible that many girls with PMDD would have missed the school during the recruitment period and were not assessed as a part of this study. The diagnosis of PMDD in the present study was based on a self-rated questionnaire, and the participants were not evaluated by a trained person using a structured diagnostic interview. The present study did not focus on the risk or predisposing factors associated with development of PMDD. Future studies should include adolescent girls, living in the community, and evaluate the participants using a structured diagnostic interview.

**CONCLUSION**

The present study suggests that 4.8% of adolescent girls suffer from PMDD and the prevalence of PMDD is higher among those with depression, GAD, and higher perceived stress. These findings suggest that there is a need to screen adolescent females for PMDD at the earliest and institute intervention to minimize its negative impact on the sufferers.

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**Conflicts of interest**

There are no conflicts of interest.

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