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RESEARCH ARTICLE

Prevalence, pattern and predictors of premenstrual syndrome (PMS) and premenstrual dysphoric disorder (PMDD) among college girls

Anitha Durairaj, Rathna Ramamurthi

Correspondence: Dr. Anitha Durairaj, Assistant professor, Department of Obstetrics and Gynaecology, Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, India. Email - dranithasrinidhi@gmail.com

ABSTRACT

Objective - To determine the prevalence, pattern and predictors of PMS and PMDD among college girls of South India. To identify the knowledge and attitude of college girls with PMS and PMDD. **Methodology** - A cross sectional questionnaire study based on Premenstrual Syndrome Screening Tool was conducted among the college student of Madurai, Tamilnadu. **Results** - The prevalence of moderate to severe PMS was 14.3% and PMDD was 3.7%. The commonest premenstrual symptom among college girls was fatigue/lack of energy, in the moderate to severe PMS category was anger and in the PMDD category was anxiety. Impairment of college efficiency or productivity was seen in 82.66% and 100% of students with moderate to severe PMS and PMDD respectively. The prevalence of moderate to severe PMS and PMDD correlated significantly with the mean age, education, heavy menstrual flow, dysmenorrhoea and family history of PMS and 85.6% college students with moderate to severe PMS and PMDD didn't perceived their symptoms as abnormal and only 16.4% had a physician consultation. **Conclusion** - PMS and PMDD are prevalent among substantial proportion of college girls with a significant negative influence on academic performance, emotional well being and behaviour. Strategies should be adopted in the college health program for timely recognition and management of PMS and PMDD in college girls.

Keywords: College girl, premenstrual syndrome, PMDD.

Although menstruation is bounded by myths and taboos in our society, menstrual disorders have gained attention. Nevertheless, premenstrual disorders (PMD) are still under recognised. PMD is a psychoneuroendocrine problem of unknown etiology. It is characterized by somatic, emotional and behavioral symptoms occurring in the luteal phase of the menstrual cycle. International Society for Premenstrual Disorders (ISPMD) consensus classified PMD into core PMD and variant PMD[1]. Premenstrual syndrome (PMS) and premenstrual dysphoric disorder (PMDD) constitute the core PMD.

Diagnosis of PMD can only be made after exclusion of physical and psychiatric disease, and relies mainly on the timing and severity of symptoms. PMD should also be differentiated from the simple premenstrual symptom that does not interfere with the daily functioning. A diagnostic

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criterion for PMS was published by ACOG in 2000 and the American psychiatric association in 2013 has recommended PMDD diagnostic criteria in the Diagnostic and Statistical Manual of Mental Disorders (fourth edition) [2].

Variation in the prevalence of PMD is due to the difference in the ethnicity, social and cultural background, diagnostic criteria and the study design. The prevalence of PMS among women is 30-40% and PMDD is 3-8% [3]. Women with bothersome or distressing PMD often go undiagnosed or under treated. This is either because they don't report the symptoms to a clinician or the clinician has difficulty in diagnosing the disorder and in most situations an adequate response to their demand is not provided [4].

PMD adversely affects education and daily life activities of college girls. As well defined diagnostic criteria and effective treatment are available now, timely recognition of this disorder will ensure individual well being and efficiency [5, 6]. The aim of this study is to estimate the prevalence, pattern and predictors of PMS and PMDD among college girls and to assess the knowledge and attitude of college girls with PMS and PMDD with regard to the perception of premenstrual symptoms, physician consultation and treatment.

Materials and Method

A cross sectional questionnaire study was conducted among the undergraduate medical and engineering students. A total of 1189 students were approached. They were explained about the purpose and procedure of the study and the confidentiality was assured. Few first year engineering students felt uneasy and didn't take part in the study. Total 1112 number of students participated in the study were given a pretested questionnaire sheet in Tamil/English language.

The questionnaire sheet was divided under 3 sections. Section I included sociodemographic data, lifestyle details, menstrual history, medical illness and medications. Section II included premenstrual symptoms and the functional impairment caused by these symptoms based on a validated premenstrual syndrome screening tool (PSST). Section III included family history and perception of premenstrual symptoms, physician consultation and treatment.

PSST is a 19 item questionnaire, comprised of 14 premenstrual symptoms and 5 functional impairments. Participant rated their experience on these 19 items that appears in the week before menses and remits within few days after the onset of menses, during most of the cycles in the last 12 months, on a 4 point Likert scale.

Premenstrual symptom screening tool – scoring criteria

Section I

Mild Moderate Severe

1 – Anger/irritability
2 – Anxiety/tension
3 – Tearfulness
4 – Depressed mood
5 – Decrease interest in academic work
6 - Decrease interest in home
7 - Decrease interest in social activities
8 – Difficulty in concentrating
9 – Fatigue/lack of energy
10 –Over eating/food craving
11 – Insomnia
12 - Hypersomnia
13 – Feeling overwhelmed
14 – Physical symptoms (breast tenderness/swelling, headache, joint/muscle pain, bloating, weight gain)

Section II

Mild Moderate Severe

A – Interferes with education
B – Interferes with relationship of friends
C - Interferes with relationship of family
D – Interferes with social life activities
E – Interferes with house/hostel responsibility

The following criteria must be present for diagnosis of PMDD -

1. At least one of 1, 2, 3 or 4 in section I is severe.
2. In addition, at least four of 1 – 14 in section I are moderate to severe.
3. At least one of A, B, C, D or E in section II is severe.

The following criteria must be present for diagnosis of moderate/ severe PMS -

1. At least one of 1, 2, 3 or 4 in section I is moderate to severe.
2. In addition, at least four of 1 – 14 in section I are moderate to severe.
3. At least one of A, B, C, D or E in section II is

moderate to severe.

College students of age 17-25 years with regular menstrual cycle were included. Students with irregular menstrual cycle, medical disease like psychiatric illness, epilepsy, migraine and on medications like oral contraceptive pills, anxiolytics and antipsychotic drugs were excluded from the study.

Finally, 1047 students fulfilled the eligibility criteria. The collected data were analysed with IBM.SPSS statistics software 23.0 Version. To describe about the data descriptive statistics frequency analysis, percentage analysis were used. To find the significance in categorical data Chi-Square test was used.

Table 2: Analysis of pattern of premenstrual symptomatology

Symptoms	No/mild PMS N=858 (%)	Moderate to severe PMS N=150 (%)	PMDD N=39 (%)	P
Anger/irritability	500 (58.3)	144 (96.0)	36 (92.3)	0.0005
Anxiety/tension	316 (36.8)	136 (90.7)	39 (100)	0.0005
Tearfulness	314 (36.6)	125 (83.3)	35 (89.7)	0.0005
Depressed mood	175 (20.4)	122 (81.3)	36 (92.3)	0.0005
Decrease interest in work	456 (53.1)	126 (84.0)	35 (89.7)	0.0005
Decrease interest in home	253 (29.4)	93 (62.0)	28 (71.8)	0.0005
Decrease interest in social activities	260 (30.3)	99 (66.0)	26 (66.7)	0.0005
Difficulty concentrating	441 (51.4)	129 (86.0)	37 (94.9)	0.0005
Fatigue/lack of energy	684 (79.7)	142 (94.7)	38 (97.4)	0.0005
Overeating/food craving	225 (26.2)	76 (50.7)	24 (61.5)	0.0005
Insomnia	228 (26.6)	94 (62.7)	27 (53.8)	0.0005
Hypersomnia	361 (42.0)	99 (66.0)	27 (69.2)	0.0005
Feeling overwhelmed	273 (31.8)	115 (76.7)	33 (84.6)	0.0005
Physical symptoms	611 (71.2)	138 (92.0)	36 (92.3)	0.0005

Results

According to the PSST scoring criteria, the prevalence of moderate to severe PMS among the college students was 14.3% and PMDD was 3.7% (table 1). The pattern of symptomatology is shown in table 2. One thousand eighty four (97.5%) of students reported atleast 1 premenstrual symptom and the commonest symptom was fatigue/lack of energy (82.5%). In the moderate to severe PMS category, anger/irritability (96%) was the commonest symptom, followed by fatigue/lack of energy (94.7%) and physical symptoms (92%). In the PMDD category, the commonest symptom was anxiety/tension (100%), followed by fatigue/lack of energy (97.4%) and difficulty in concentration (94.9%).

Table 1: Prevalence of PMS and PMDD

Category	Frequency	Percent
No/mild PMS	858	81.9
Moderate to severe PMS	150	14.3
PMDD	39	3.7

The pattern of functional impairment among college girls is shown in table 3. The most frequent functional impairment in the moderate to severe PMS and PMDD group was noted in college efficiency/productivity, which was reported by 82.7% and 100% of students respectively.

The predictors of PMS and PMDD among college girls is shown in table 4. The prevalence of PMS and PMDD correlated significantly with the mean age >19 years, medical education, heavy menstrual bleeding, dysmenorrhoea and family history of PMS. There was no statistically significant difference with respect to residence, socioeconomic status, age of menarche, days of menstrual bleeding, physical activity and basal metabolic index (BMI).

Table 3: Analysis of pattern of functional impairment

Functional impairment	No/mild PMS n=858 (%)	Moderate to severe PMS n=150 (%)	PMDD n=39 (%)	P
College/work efficiency or productivity	262 (30.5)	124 (82.66)	39 (100)	0.0005
Relationship with friends	161 (18.8)	115 (76.7)	36 (92.3)	0.0005
Relationship with family	136 (15.9)	110 (73.3)	28 (71.8)	0.0005
Social life activities	198 (23.0)	107 (71.3)	32 (82.0)	0.0005
Home responsibilities	151 (17.6)	94 (62.7)	31 (79.5)	0.0005

Table 4: Analysis of predictors of PMS and PMDD

Characteristics		No/mild PMS N=858 (%)	Moderate to severe PMS N=150 (%)	PMDD N=39 (%)	P
Mean age in years		19.02	19.29	19.67	0.002
Education	MBBS	298 (74.5)	76 (19.0)	26 (6.5)	
	BE	560 (86.6)	74 (11.4)	13 (2.0)	0.0005
Residence	House	569 (82.8)	95 (13.8)	23 (3.3)	
	Hostel	289 (80.3)	55 (15.3)	16 (4.4)	0.523
Socioeconomic status	Upper	65 (84.4)	9 (11.7)	3 (3.9)	
	Middle	731 (82.5)	122 (13.8)	33 (3.7)	
	Lower	62 (73.80)	19 (22.6)	3 (3.6)	0.251
Mean age of menarche		12.83	12.67	12.72	0.405
Mean days of bleeding		4.71	4.88	5.31	0.079
Amount of bleeding	Reduced	51 (82.3)	11 (17.7)	0 (0.0)	
	Moderate	758 (83.7)	121 (13.4)	27 (3.0)	0.0005
	Heavy	49 (62.0)	18 (22.8)	12 (15.2)	
Dysmenorrhoea	Absent	382 (88.0)	44 (10.1)	8 (1.8)	
	Present	476 (77.7)	106 (17.3)	31 (5.1)	0.0005
Regular physical activity	Absent	712 (82.5)	122 (14.1)	29 (3.4)	
	Present	146 (79.3)	28 (15.2)	10 (5.4)	0.357
Mean Body mass index (kg/m2)		21.38	21.99	21.73	0.437
Family history of PMS	Absent	657 (86.0)	89 (11.6)	18 (2.4)	
	Present	201 (71.0)	61 (21.6)	21 (7.4)	0.0005

Table 5: Analysis of knowledge and attitude towards PMS and PMDD

Characteristics		No/mild PMS N=858 (%)	Moderate to severe PMS N=150 (%)	PMDD N=39(%)	P
Perception of premenstrual symptoms	Normal	812 (84.1)	131 (13.6)	23 (2.4)	
	Abnormal	46 (56.8)	19 (23.5)	16 (19.8)	.0005
Consultation for premenstrual symptoms	No	786 (83.3)	125 (13.2)	33 (3.5)	
	Yes	72 (69.9)	25 (24.3)	6 (5.8)	0.004
Treatment for premenstrual symptoms	No	807 (83.1)	128 (13.2)	36 (3.7)	
	Yes	51 (67.1)	22 (28.9)	3 (3.9)	0.001

The attitude of college girls with PMS and PMDD is shown in table 5. Among the 189 students with moderate to severe PMS and PMDD, only 16.4% students had a physician consultation and 13.2% students took treatment.

Discussion

This study elucidates the prevalence, pattern and predictors of PMS and PMDD among college girls and their knowledge and attitude.

The prevalence of PMS and PMDD in our study was 14.3% and 3.7% respectively. This is in concordance with the study by Raval et al from western India and few more studies [7-10]. However, two other studies from western India had found high prevalence rate and this could be due to inclusion of PG students and nursing staff [11,12]. The high prevalence rates reported from other countries can be attributed to the difference in ethnicity and sociocultural variables [13-18].

More than 90% of students reported atleast 1 premenstrual symptom in the study by Raval et al and Bakshani et al and this is similar to our results [8, 9]. In the present study, the pattern of symptomatology is different between college girls with PMS, PMDD and college girls without PMS and PMDD and it also varied between studies. The commonest symptom in the college girls without PMS and PMDD reported in this study and by Raval et al was fatigue/lack of energy, while it was sadness and abdominal bloating in the study by Mishra et al and in the studies from Saudi Arabia and Turkey respectively [8,11,14,15].

The commonest symptom reported in this study and few more studies in the PMS category was anger/irritability, while it was low mood and physical symptoms in the study by Bakshani et al and Balahaha et al respectively [7-9, 14]. In this study and in the study by

Raval et al, the commonest symptom reported in the more severe affective predominant PMDD group was anxiety/tension [8].

Though there is difference in symptomatology pattern between various studies globally, the predominant functional impairment in both the PMS and PMDD group reported in this study and in several studies was interference in college efficiency [7-9].

This study analysed the predictors of PMS and PMDD among college girls with respect to sociodemographic, menstrual and lifestyle variables. Mean age of the student >19 years correlated significantly with the prevalence of PMS and PMDD. Many studies have reported increased prevalence in older students [7,10,14,15,17,18], but few studies had conflicting results [8,9]. This can be explained by increased academic stress and understanding of symptoms in older students.

Medical students had statistically significant increased prevalence of PMS and PMDD than the engineering students. Several non comparative studies have reported higher prevalence rate among medical students [11,13-15,18]. This could be either due to the difference in the knowledge of the disease or academic curriculum. On the contrary, Raval et al found highest prevalence in commerce students than medical and nursing students [8]. Residence either at hostel or house and socioeconomic status are not statistically significant in the prevalence of PMS and PMDD and this is in agreement with few other studies [9,17].

Our study couldn't find any association between age of menarche and days of menstrual bleeding. But few studies had found an association with early age of menarche [8,14,17]. However in the current study, heavy menstrual bleeding had a positive correlation with PMS and PMDD. Dysmenorrhoea had been consistently associated with PMS and PMDD in several studies including ours [7,8,10,17,18].

Though many societies have recommended physical activity in the management of PMS, several studies including the present study had not found a correlation between physical activity and PMS [8,11,17,19]. Daley et al concluded that to make any evidence-based policy recommendation regarding the effectiveness of exercise, more high-quality research is required [20]. BMI had no statistically significant correlation with PMS and PMDD in the present study and in the study by Cheng et al and others [8,16].

In the current study and in numerous other studies, family history of PMS had a strong correlation with prevalence of PMS and PMDD among the college girls [7, 8,13-15,17].

In the current study, college girls had little knowledge about premenstrual disorder as majority of the students with PMS and PMDD didn't perceive their symptoms as abnormal. The health seeking behavior among college students is poor as only few students with PMS and PMDD had a physician consultation and treatment. This attitude of college girls is not only because of lack of knowledge of PMS among students but also among the parents and teachers to whom they approach initially for these symptoms [21,22].

Limitations

First, though PSST is simple and brief, its retrospective nature poses recall bias. A prospective daily recording of premenstrual symptom aids in confirming the diagnosis but it carries a high non response rate. Second, the study selectively sampled only few colleges in the urban area. Third, possible undiagnosed chronic medical illness can act as confounding factor.

Conclusion

PMS and PMDD are prevalent among substantial proportion of college girls with significant negative influence on academic performance, emotional well being and behaviour. The pattern of premenstrual symptomatology is different between PMS, PMDD and in overall college students. The predictors of PMS and PMDD are age, education, heavy menstrual flow, dysmenorrhoea and family history of PMS. The knowledge and health seeking behavior of college students towards PMD are quite low. Strategies should be drawn and implemented for timely recognition and management of PMS and PMDD in college girls.

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Anitha Durairaj[1], Rathna Ramamurthi[2]

[1] Assistant professor; [2]Professor; Department of Obstetrics and Gynaecology, Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, India.