Research Report

PREVALENCE OF PREMENSTRUAL DYSPHORIC DISORDER AMONG HIGH SCHOOL GIRLS OF GADAG DISTRICT, KARNATAKA, INDIA- A SCHOOL-BASED CROSS-SECTIONAL STUDY

Nitin O Pattanashetty[1], Jitendra Mugali[2]*, Niharika HS[2]

[1]JGM Medical College, Hubli
[2]Gadag Institute of Medical Sciences
*Corresponding Author: Associate professor, Gadag institute of medical sciences, Gadag, Karnataka Pin code- 582103, India.
Email: drjitendramugali2@gmail.com

ABSTRACT

Background: Premenstrual dysphoric disorder (PMDD) has consequences on behaviour, cognitive abilities, mental health status, academic performance, and overall quality of life. The study examined the prevalence of premenstrual dysphoric disorder (PMDD) among high school going girls of Gadag. **Methods:** A school-based cross-sectional study was conducted among 900 high school going girls aged 12-16 years from government and private schools of Gadag district. The data was collected using a pre-tested semi-structured questionnaire. The proforma included socio-demographic profile and symptoms related to PMDD. A detailed history was obtained from parents and teachers. Data were analysed using coGuide software, V.1.03 and the *p*-value was set at < 0.05. **Results:** In the present study, the prevalence of PMDD was 4.89%. Out of 900 girls, 650(70%) were studying in 9th and 10th standard. Forty-four students were diagnosed with PMDD, out of which 14 (4.32%) were aged 14years, 17 (4.89%) were in 9th St, 30 (4.3%) belonged to English medium, and the majority, 39 (10.1%), were Hindus. Hindu religion was found to be significantly associated with PMDD (P-value of <0.001). No significant difference in PMDD was seen with age (p-value 0.325), the standard of studying (P-value of 0.948), and medium of instruction (P-value of 0.123). **Conclusion:** The magnitude of PMDD, according to this study, is 4.89%, and the menstrual health of young schoolgirls, particularly those in the age group 12 to 16 years, needs significant public health attention.

Keywords: Premenstrual dysphoric disorder, Premenstrual syndrome, Adolescent.

INTRODUCTION

Premenstrual syndrome(PMS), described by Frank and Horney in 1931[1], can be broadly classified as any constellation of psychological and physical symptoms that recur regularly in the luteal phase of the menstrual cycle; remit for at least one week in the follicular phase and cause distress and functional impairment. It is generally accepted that, to be clinically significant, the symptoms should be of at least moderate intensity and cause functional impairment. Severe symptoms result in dysphoria and cause severe impairment, and it is referred to as premenstrual dysphoric

Access the article online:
https://kjponline.com/index.php/kjp/article/view/273
DOI: https://doi.org/10.30834/KJP.34.2.2021.273
Received: 05/05/2021. Accepted: 02/09/2021.
Web publication: 04/09/2021

QR Code

Please cite this article as: Pattanashetty NO, Mugali J, Niharika HS. Prevalence of premenstrual dysphoric disorder among high school girls of Gadag district, Karnataka, india- a school-based cross-sectional study. Kerala Journal of Psychiatry 2021; 34(2):90-95

disorder(PMDD).[2] The global prevalence of PMS is 47.8% (95% CI: 32.6–62.9).[3]

PMDD is a more severe form of PMS which occurs in a small number of females and results in significant disability and loss of function. Altogether results show, that up to 90% of women of reproductive age experience several premenstrual symptoms varying from mild to severe; around 20–40% of them experience PMS, and 2–8% suffer from the premenstrual dysphoric disorder (PMDD).[4] Females with PMDD complain of breast tenderness, severe lower abdomen pain, bloating, joint and muscle pain, weight gain, sleep disturbances, irritability, anger, tension, low concentration, mood instability, and marked depression.[5] The presence of these symptoms described by the Diagnostic and Statistical Manual of Mental Disorder-IV (DSM-IV) adversely affects their academic, social, and personal performance.[6]

Globally, adolescents account for 1/5th of the population in the world that is more than 1 billion. Menstruation is a landmark in every woman's life. It is a major physiological event that transmits the female from girlhood to womanhood. Its onset may occur as early as nine years or as late as 17 years, but age 12 is the average. The first menstrual period is called menarche. It usually starts between the ages of 11 and 14. But it can happen as early as age nine or as late as 15.[7]

The age at menarche shows many socioeconomic, environmental, nutritional, and geographical differences in the societies. The causes of PMS and PMDD have not yet been clearly elucidated. However, they have been suggested to include hormonal changes, neurotransmitters, stress, and lifestyle habits involving diet and exercise. [8] The medical and social consequences of premenstrual, menstrual symptoms, and disorders of menstruation influence not only the individual but also her family and society. Regarding adolescent girls, it may manifest as loss of school days leading to poor progress in education. It may lead to problems in the continuation of her education.[9]

The previous study by Kitamura et al. [10] reported a correlation between dysmenorrhea and PMS/PMDD in Japanese high school students. They also showed that the frequencies of 'moderate-to-severe PMS' and 'PMDD' in Japanese high school students were 11.6 and 2.6 % higher, respectively, than that of adult women (5.3 and 1.2 %). These findings suggested that PMS and PMDD are major problems that affect the daily lives of adolescents, possibly to a larger extent than adults.

Previous studies by Raval et al.[11] in Gujarat among 489 college students found the prevalence of PMS was 18.4% and of PMDD was 3.7%. Mishra et al., in a study of medical students in Delhi, reported that 37% of participants had PMDD.[12] Although several studies have been conducted to assess the prevalence of both PMS and PMDD, studies focusing only on PMDD are very few. PMDD is a poorly researched topic in southern India, and there is a deficit in the available pool of knowledge regarding its severity. Therefore, we aimed to study the prevalence of PMDD among high school going girls of Gadag district, Karnataka, India.

MATERIALS AND METHODS

Study design: A descriptive cross-sectional study

Study population: High school girls

Study setting: Private and government schools

Study period: For a period of two months from August 2017 to October 2017.

Sample size calculation:

The sample size was calculated assuming the expected proportion of PMS/PMDD as 18% as per a previously published study by Padmavathi et al. [7] Based on the formula recommended by Daniel et al. [13], the required sample size would be 630. To account for a non-participation rate of about 30%, 189 additional subjects were included in the study, and The total sample size was 900.

Sample size and sampling technique: A total of 900 subjects were selected using the multistage random sampling method. In Gadag city, there are 47 High schools; among them, five are government and 42 are private schools.

Stage 1: The schools were classified into four geographical sectors, namely, northeast, northwest, southeast, southwest. This classification allows all the geographical areas of Gadag to be selected, irrespective of the type of medium, syllabus, and belongingness (private or government).

Stage 2: All the schools were given a number, and corresponding chits were made. The schools were

randomly selected by picking the chits. An equal percentage of schools were selected from each sector

Stage 3: The selected schools were visited, and all the batches in 8th, 9th and 10th grades were listed. One batch was selected randomly from each grade. An equal number of girls were selected from 8, 9, and 10 standards in each school.

Ethical considerations: Ethical clearance was obtained from the ethics committee of Gadag Institute of Medical Sciences. The schools were selected randomly as described above. Permissions from heads of the selected schools were attained before commencing the study. Further details of the study were described to the concerned teacher and students. Consent was obtained from their parents and teachers.

Inclusion criteria:

Girls above 12 years of age

Girls who have attained menarche

Girls with regular menstrual cycles for the last three consecutive months.

Exclusion criteria:

Girls who were not present in the school at the time of the survey,

Girls on treatment for the respective disorders

Girls not willing to participate.

Data collection: The data was collected using a pre-tested semi-structured questionnaire. The proforma includes the socio-demographic profile of the study subjects, signs and symptoms related to premenstrual dysphoric disorders, and premenstrual syndrome. A detailed history was obtained from parents and teachers. Diagnostic and statistical manual of mental disorders 5th edition (DSM-5) was used to assess premenstrual dysphoric disorder.[14]

Statistical methods:

Study variables: The outcome variable was PMDD which was assessed by the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). PMDD was treated as a categorical variable (Yes/No). Independent variables included age, standard, curriculum, medium of school, and religion.

Descriptive analysis was presented as frequency and proportion for age, curriculum, medium of instruction, and PMDD symptoms. Categorical outcomes were compared between study groups using the chi-square test.

P-value < 0.05 was considered statistically significant. Data will be analysed by using coGuide software, V.1.03.[15]

Table 1: Summary of baseline parameter (N=900)

Parameter	Summary
Age (in years)	
12	8 (0.89%)
13	230 (25.56%)
14	324 (36.00%)
15	275 (30.56%)
16	63 (7.00%)
Standard	
8	249 (27.67%)
9	348 (38.67%)
10	303 (33.67%)
Curriculum	
CBSE	336 (37.33%)
State	564 (62.67%)
Medium of school	
English	698 (77.67%)
Kannada	201 (22.33%)
PMMD	
Present	44 (4.89%)
Absent	856 (95.11%)

RESULTS

A total of 900 subjects were included in the final analysis. Demographic variables are shown in Table 1. Only 44(4.89%) were diagnosed with PMDD. The association of PMDD with age, grade, religion, and medium of study was tested using the chi-square test for two independent samples. The majority with PMDD were Hindus 39 (10.1%)), and analysis (Table 2) showed that there was a significant association between PMDD symptoms and religion (p-value <0.001). The Association between PMDD symptoms and grade (p-value of 0.948) was not significant statistically. Medium of instruction (p-value 0.123) and age (p-value 0.325) were not associated with PMDD symptoms.

DISCUSSION

According to this cross-sectional study conducted among various schools of Gadag, which involved 900 study subjects of the adolescent age group, the prevalence of PMDD is 4.89%. This finding is similar to

Table 2: Comparison of baseline parameter between PMDD(N=900)

Parameter	PMDD		P-value
	Present	Absent	
Age (in years)			
12 (N=8)	1 (12.5%)	7 (87.5%)	0.325
13 (N=230)	12 (5.22%)	218 (94.78%)	
14 (N=324)	14 (4.32%)	310 (95.68%)	
15 (N=275)	11 (4%)	264 (96%)	
16 (N=63)	6 (9.52%)	57 (90.48%)	
Standard			
8 (N=249)	13 (5.22%)	236 (94.78%)	0.948
9 (N=348)	17 (4.89%)	331 (95.11%)	
10 (N=303)	14 (4.62%)	289 (95.38%)	
Medium			
English (N=698)	30 (4.3%)	668 (95.7%)	0.123
Kannada (N=201)	14 (6.97%)	187 (93.03%)	
Religion			
Christianity (N=102)	1 (0.98%)	101 (99.02%)	<0.001
Hindu (N=386)	39 (10.1%)	347 (89.9%)	
Jain (N=206)	2 (0.97%)	204 (99.03%)	
Islam (N=206)	2 (0.97%)	204 (99.03%)	

A cross-sectional study by Gupta et al.[16]. They measured depression and found that nearly 5% of adolescent girls suffer from PMDD, with a higher prevalence of depression, GAD, and higher perceived stress. The finding was in contrast to a descriptive correlational cross-sectional study by Hamaideh SH et al. [17], where the prevalence of PMDD as measured by research criteria of the DSM-IV-TR was 10.2%. The possible explanation for this difference might be the smaller sample size, socio-demographic characteristics, time of data collection, and curriculum difference.

In the present study, the majority, 324 (36.00%), were aged 14 years, followed by 275(30.56%) aged 15 years and 386(45%) were Hindus. The findings were very much similar to a study by Mossie TB et al. among 181 young schoolgirls [18], where the age of participants lie from 14 to 22 years with mean and median ages of 16.6 and 17 years. This finding was in contrast to Minichil W et al., who conducted among female medical students [19], where the age of participants ranged from 18 to 26 years with a mean age of 20.9±1.66 (SD) years. The majority, 284 (73.6%) of the participants, were orthodox Christian religion followers.

In the present study, only 44(4.89%) reported the symptoms of PMDD. This finding contrasts with a study by Budarapu S among female medical students of South India [20], where the premenstrual symptoms screening tool (PSST) was used for screening. Out of 635 students, 88 students qualified for PMDD. PSST is a very useful tool for screening these disorders in adolescent girls. It is highly sensitive (90.9%), and the predictive value for negative PSST is also high (97%). This helps in identifying women who do not suffer PMS or PMDD very precisely. This tool was not used in the present study.

In the present study, the analysis showed a significant association of Hindu religion with PMDD symptoms with (p-value of <0.001). The present study's findings were compared with a narrative review by Zendehdel M et al. [21], where they found out that there is a relationship between menstrual distress and religion. Culture affects the probability of development and prevalence of PMDD. However, religion is among the important factors that are referred to as a predictor for the discomfort of menstruation onset. Wherever religion has a positive attitude toward menstruation, positive feelings and less anxiety and stress are observed. The study concludes that women who have many menstruation-related taboos suffer from a large amount of discomfort associated with menstruation. It seems that Protestants, who are heterogeneous religious groups, suffer less.

These findings need to be replicated in a large-scale community study for obtaining more accurate prevalence rates among this age group. Using prospective daily dairies will help in the accurate diagnosis of PMS and PMDD. Various educational programs related to menstrual health and various disorders related to menstruation have to be conducted before the start of the study to create awareness among

young women and reduce the effect of cultural taboos related to menstruation. Without such programs, young women find it difficult to volunteer to share information related to menstruation.

This study analysed the predictors of PMDD among school girls with respect to age, standard, medium of education, and religion. Only religion was significant with PMDD. These findings were in contrast to a study by Durairaj A et al. [22], where they analysed the predictors of PMS and PMDD among college girls with respect to socio-demographic, menstrual, and lifestyle variables, and all were found to be significant with PMDD and PMS.

The findings of the study emphasise the need for health professionals to implement health education programs at a national base about PMDD in all educational institutions, where the health education programs are intended to increase the level of awareness among students. The screening will enable the early detection of this problem, thus preventing the complication of students. All the schools and institutions are recommended to offer health care clinics at their campus.

The main strength is that we used an adequate sample for the study following appropriate sampling techniques. The magnitude of our study might also be affected by traditional beliefs, socialisation factors, self-experiences of the participants, and strain due to menstruation in the Indian scenario. These may have influenced the reporting of premenstrual symptoms.

Limitations: Several limitations are present in this study. These include a cross-sectional study design in which causal relationships could not be confirmed. There is a possibility that many girls with PMDD would have missed school during the recruitment period and were not assessed as a part of this study. The outcome variable was measured by the participants' response which may introduce observation and recall bias. We did not focus on the risk or predisposing factors or other psychological issues like depression and anxiety associated with PMDD. We did not use any standardised scale to measure PMDD symptoms. Future multi-centric studies are recommended and should include adolescent girls living in the community to generalise the findings and evaluate the actual association of PMDD with other predisposing factors.

Conclusion: The magnitude of PMDD according to this cross-sectional study conducted among various schools of Gadag district, which involved 900 study subjects of adolescent age group, is 4.89%. In this study, PMDD was seen at all ages of adolescence. These findings suggest a need to screen adolescent females for PMDD at the earliest and institute intervention to minimise its negative impact on students' academic performance and overall quality of life. The awareness should mainly focus on the biological, psychological, and social aetiology of PMDD from a different point of view to reduce negative experiences.

Financial support and sponsorship:
None.

Conflict of interest:
None declared.

Acknowledgements:
We acknowledge the technical support in data entry, analysis and manuscript editing by "Evidencian Research Associates."

REFERENCES

1. Frank RT. The hormonal causes of premenstrual tension. Arch Neurol Psychiatry. 1931;26(5):1053–7.
2. Thodupunuri AV, Samer SF, Hassan MA. A Study to Determine the Prevalence of Premenstrual Syndrome in Young Females. 2020;8(04):2–5.
3. Direkvand-Moghadam A, Sayehmiri K, Delpisheh A, Satar K. Epidemiology of premenstrual syndrome, a systematic review and meta-analysis study. J Clin Diagnostic Res. 2014;8(2):106–9.
4. Chumpalova P, Iakimova R, Stoimenova-Popova M, Aptalidis D, Pandova M, Stoyanova M, et al. prevalence and clinical picture of premenstrual syndrome in females from Bulgaria. Ann Gen Psychiatry. 2020;19(1):1–7.
5. Shamnani G, Gupta V, Jiwane R, Singh S, Tiwari S, Bhartiy S. Prevalence of premenstrual syndrome and premenstrual dysphoric disorder among medical students and its impact on their academic and social performance. Natl J Physiol Pharm Pharmacol. 2018;8(9):1205.
6. American Psychiatric Association. Diagnostic and statistical manual of mental disorders: DSM-IV [Internet]. 4th ed. Washington (DC): American Psychiatric Association; 1994 [cited Jun 25 2021]. 866 p. Available from: http://www.psychiatryonline.com/DSMPDF/dsm-iv.pdf.
7. Padmavathi P, Sankar R KN. A study on the prevalence

of premenstrual syndrome among adolescent girls in a selected school at erode. Asian J Nurs Educ Res. 2012;2(3):6.
8. Tadakawa M, Takeda T, Monma Y, Koga S, Yaegashi N. The prevalence and risk factors of school absenteeism due to premenstrual disorders in Japanese high school students-a school-based cross-sectional study. Biopsychosoc Med. 2016;10(1):1–7.
9. Dambhare DG, Wagh S V., Dudhe JY. Age at menarche and menstrual cycle pattern among school adolescent girls in Central India. Glob J Health Sci. 2012;4(1):105–11.
10. Kitamura M, Takeda T, Koga S, Nagase S, Yaegashi N. Relationship between premenstrual symptoms and dysmenorrhea in Japanese high school students. Arch Womens Ment Health. 2012;15(2):131–3.
11. Raval CM, Panchal BN, Tiwari DS, Vala AU, Bhatt RB. Prevalence of premenstrual syndrome and premenstrual dysphoric disorder among college students of Bhavnagar, Gujarat. Indian J Psychiatry. 58(2):164–70.
12. Mishra A, Banwari G, Yadav P. Premenstrual dysphoric disorder in medical students residing in hostel and its association with lifestyle factors. Ind Psychiatry J. 2015;24(2):150.
13. Daniel WW. Determination of sample size for estimating proportions. Biostatistics A foundation for analysis in the health sciences. 1999;8:189-90.
14. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 5th ed. Washington, DC: APA Press; 2012. p. 465-75.
15. BDSS Corp. Released 2020. coGuide Statistics software, Version 1.0, India: BDSS corp. Available from: https://www.coguide.in. [Last accessed on 2021 Jun 24].
16. Gupta M, Dua D, Kaur H, Grover S. Prevalence of premenstrual dysphoric disorder among school-going adolescent girls. Ind Psychiatry J. 2019;28(2):198.
17. Hamaideh SH, Al-Ashram SA, Al-Modallal H. Premenstrual syndrome and premenstrual dysphoric disorder among Jordanian women. J Psychiatr Ment Health Nurs. 2014;21(1):60–8.
18. Mossie TB, Tesfaye YB, Metekiya WM, Tegegne MT. Magnitude of premenstrual dysphoric disorder and associated factors among high school girls, Mekelle, North Ethiopia. Ethiop J Heal Dev. 2015;29(3):170–5.
19. Minichil W, Eskindir E, Demilew D, Mirkena Y. Magnitude of premenstrual dysphoric disorder and its correlation with academic performance among female medical and health science students at University of Gondar, Ethiopia, 2019: a cross-sectional study. BMJ Open. 2020;10(7):e034166.
20. Budarapu S, Sadam H, K H, M DN, K HR, Dhanekula G. A Study to Assess the Prevalence of Premenstrual Syndrome and Premenstrual Dysphoric Disorder and Various Coping Strategies used by Students in A Womens Medical College from South India. Int J Contemp Med Res. 2018;5(11):1–5.
21. Zendehdel M, Elyasi F. Biopsychosocial etiology of premenstrual syndrome: A narrative review. J Fam Med Prim care. 7(2):346–56.
22. Durairaj A, Ramamurthi R. Prevalence, pattern and predictors of premenstrual syndrome (PMS) and premenstrual dysphoric disorder (PMDD) among college girls. New Indian J OBGYN. 2019;5(2):93–8.