



Prevalence of Premenstrual Syndrome in Undergraduate MBBS Students and their Work-related Quality of Life

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Abstract

Aims & Objectives: Premenstrual syndrome (PMS) refers to psychiatric and somatic symptoms that occur in the late luteal phase of menstruation. Premenstrual dysphoric disorder (PMDD) is primarily a psychiatric disorder with more severe symptoms as compared to PMS. The prevalence of these entities has not been homogenous in the studies conducted in the past. Thus, the aim of this study is to find the prevalence of PMS and PMDD in undergraduate medical students and its effect of work-related quality of life (WrQOL).

Materials & Methods: The study followed a longitudinal observational design. Students were cross-sectionally assessed with Premenstrual Symptoms Screening Tool (PSST). Students who screened positive for severe PMS on PSST were asked to keep a prospective record using Daily record of severity of problems scale (DRSP) and WrQOL scale.

Results: 228 students participated in the cross-sectional assessment. The prevalence of severe PMS and PMDD in our sample was found to be 29.4% and 6.1% respectively. Students who had medical comorbidities had higher chances of reporting of PMS. Of 47 students who agreed for prospective record-keeping on DRSP, 10 students fulfilled the criteria for severe PMS. WrQOL was significantly poorer in students with PMS.

Discussion: Though there was significant drop-out in the prospective assessments, the results of the cross-sectional assessments were on expected lines. However, there is a need for more stringent prospective studies on this topic.

Conclusion: PMS and PMDD is highly prevalent and often co-occur with medical comorbidities and is associated with poor WrQOL.

INTRODUCTION

Premenstrual disorders refer to the psychiatric and somatic symptoms typically occurring weeks before the menstruation cycle. Premenstrual disorders are a group of disorders which fall in the overlap of mental health disorders and gynecological disorders. Classically, the symptom clusters in these disorders consist of somatic symptoms and psychiatric symptoms; and can include psychological problems, bloating, weight gain, breast tenderness, aches and pain, poor concentration, sleep disturbances and appetite changes. These symptoms cumulatively can lead to significant dysfunction in daily function-

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ing. A look into the current classificatory systems makes it clear that there are two major diagnostic entities that co-exist.¹ Premenstrual syndrome (PMS) is a recognized diagnosis according to the International classification of disease 10th edition (ICD 10).² Overall, this diagnosis is more commonly used in a gynaecology clinic. Whereas, Premenstrual Dysphoric Disorder (PMDD) is more commonly used in by psychiatrists and is a valid diagnosis according to the Diagnostic and Statistical Manual 5th edition.³ Though the understanding about the disorders is still evolving, both PMS and PMDD share their etiopathological explanations. Both the disorders present with hypersensitivity of the central nervous system to the hormonal fluctuations that tend to happen during the menstrual cycles.

The prevalence of PMS has been well studied in the previous years though there has been a huge variation in the results that has been obtained. For example, in a systematic review and meta-analysis that was conducted using prevalence studies of PMS (n=17) which were published between 1996 to 2011 and were published in English language, the pooled prevalence of PMS was found to be 47.8% (4). However, the results showed significant variation across the centers as results of a study from France found the prevalence to be at 12%, whereas results from Iran showed the prevalence at 98%.⁵ Furthermore, the study also found an increasing trend in the prevalence of PMS over the years. Traditionally, across studies, the prevalence of PMDD has been found to be lesser than the prevalence of PMS. A Japanese study on this topic conducted on 1187 Japanese females, found the prevalence of PMS to be 5.3%, but the prevalence of PMDD was 1.2%.⁶ The results from studies in India has also showed considerable variation. A systematic analysis conducted using 25 Indian studies, found the pooled prevalence of PMS to be 43%, but the prevalence of PMDD was 8%.⁷ The study also pointed out that there was significant heterogeneity in the results and the various factors contributing to that include the sampling frames, the tools used and the geographical location of the centers. The study also reported that the prevalence of PMS in the Indian adolescent population is 49.6%. Thus, it is imperative to state that the actual prevalence of PMS and

PMDD is substantial, yet unknown. However, the current research has made it clear that premenstrual symptoms can play a detrimental role in the quality of life of the females of the females suffering from these conditions.⁸

With this background, the current study was conducted to find the prevalence of severe PMS and PMDD in undergraduate medical students; and to find the effect of severe PMS and PMDD on their quality of life. We chose undergraduate medical students to conduct this study because they represent a vulnerable group of subjects who have significant work-related stressors.

METHODOLOGY

The current study was conducted in a Medical College of North India. The study was a longitudinal observational study, with an initial cross-sectional evaluation followed by a prospective evaluation. Ethical clearance was obtained from the Institute Ethics Committee. Written informed consent was obtained from all respondents. For the purpose of this study, we decided to include all undergraduate female medical students of the Medical College. The only exclusion criteria for the students were if they declined to provide written informed consent. From existing literature the prevalence of PMS was found to be 31%⁹ United Kingdom, and France. A sample of 1045 menstruating women aged 18-49. Considering margin of error 5%, confidence level 90% and unlimited population the sample size calculated was 229.

All the recruited students were then asked to respond to the following study tools. Firstly, a socio-demographic and clinical proforma was used which was a structured assessment schedule that included details like name, age, education, family income, past medical, surgical and menstrual history (menarche, duration of cycle, regularity of cycles, flow or any other abnormality, menstrual hygiene, phase of menstrual cycle). Subsequently, the Premenstrual symptoms screening tool (PSST) was a 14 item likert scale designed by Steiner et al. that was used as a tool to screen patients suffering from PMS. The tool provides specific cut-off for screening of PMS which had been widely used and was used for the purpose of this study.¹⁰ The subjects who had

cleared the cut-off on PSST was then recruited for the further prospective evaluation.¹⁰

In this phase, the recruited students were asked to keep a prospective record using the Daily record of severity of problems scale (DRSP) for one cycle of menstruation for the determination of PMS and respond to Work related Quality of Life Scale (WrQOL). The DRSP¹¹ was used for the purpose of prospective record keeping for one cycle among the students who has screened positive for severe PMS on PSST. This tool had also been widely used for prospective record keeping. The WrQOL is a well validated tool¹² that was used for the purpose of measuring the Work-related quality of life of the patients.

The statistical analysis was conducted using the SPSS version 22. Descriptive statistics were used to depict the baseline socio-demographic and clinical parameters. The chi-square tests (for categorical variables) and the independent sample t-tests (for continuous variables) were used to compare the variables across students who screened positive for PMS versus students who did not.

RESULTS

The total number of participants who were recruited after obtaining informed consent was 228. Table 1 shows the clinical details of the recruited participants.

Table 1 show that out of 228 female medical students, the mean age of the students was 20.46 years. The mean age for menarche was 13.17 years and the mean of duration of cycle in days was 4.17

Table 2 shows that 17 (7.5%) subjects had a comorbid medical disorder and 8 subjects among them were concurrently on medication. Among all the students 188 students had normal regular cycle while 40 students had irregular cycle.

Table 1: Table showing descriptive statistics of clinical details of recruited subjects

	Mean	S.D
Age (in years)	20.46	1.616
Education (in years)	15.78	1.293
Menarche (in years of age)	13.17	1.377
Duration of cycle (in days)	4.17	0.991

Table 2: Table showing frequencies of clinical details of recruited subjects

	Yes (n, %)	No (n, %)
Known medical comorbidity	17 (7.5%)	211 (92.5%)
Any concurrent medication	8 (3.5%)	220 (96.5%)
Regularity of cycle	188 (82.5%)	40 (17.5%)
Dysmenorrhea	122 (53.5%)	106 (46.5%)

Table 3: Table showing prevalence of Severe PMS and PMDD according to PSST in recruited subjects

	Yes (n, %)	No (n, %)
Severe PMS	67 (29.4%)	161 (70.6%)
PMDD	14 (6.1%)	214 (93.9%)

The PSST was applied as a screening tool to screen for severe PMS and PMDD. Out of 228 subjects, 67 (29.4%) of the subjects qualified for severe PMS and 14 subjects (6.1%) qualified for PMDD (see Table 3).

Table 4 shows comparison of categorical clinical variables between subjects with and without Severe PMS and PMDD. It was found that the chances of subjects who had a history of known medical disorder to report of Severe PMS were significantly high.

67 subjects who screened positive for Severe PMS according to PSST were asked to keep prospective records of their menstrual cycle using DRSP. Among them, 20 declined to provide prospective data on DRSP and 47 agreed. Out of these 47 subjects, only 34 finally gave prospective data on DRSP for one cycle. 16 subjects in the sample had score of more than 50 on the day 1 of menstrual cycle, which was a screening factor in DRSP. On further analysis, 10 of these subjects had more than 30% variability on their score between the luteal phase and follicular phase of menstruation, which was the confirmatory point to diagnose PMS according to DRSP (Figure 1).

Comparing the scores of WrQOL on patients with and without PMS on DRSP, it was found that patients who qualified for PMS on DRSP had significantly poorer scores on WrQOL as compared to subjects who did not qualify for PMS on DRSP (Table 5).

DISCUSSION

Our study used a longitudinal observational approach to study the prevalence of PMS and PMDD in a sample of female medical undergraduates. In the first phase a cross-sectional assessment of the prevalence of PMS and PMDD was done using the

Table 4: Table showing comparison of clinical variables among patients with and without Severe PMS and PMDD

Yes	Severe PMS			PMDD			
	No	Chi Square, (dF), p-value	Yes	No	Chi Square, (dF), p-value		
Known medical comorbidity	Yes	9	8	4.912, 1, 0.027*	3	14	4.220, 1, 0.040*
	No	58	153		11	200	
Any concurrent medication	Yes	4	4	1.698, 1, 0.193	2	6	5.117, 1, 0.024*
	No	63	161		12	208	
Regularity of cycle	Yes	53	135	0.737, 1, 0.0391	10	178	1.254, 1, 0.263
	No	14	26		4	26	
Dysmenorrhea	Yes	40	82	1.463, 1, 0.227	7	115	0.074, 1, 0.786
	No	27	79		7	99	

*- $p < 0.05$

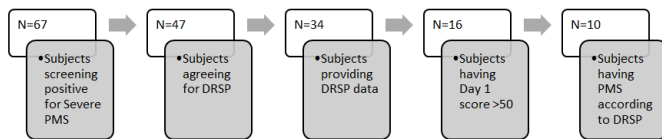


Figure 1: Figure depicting drop-out of subjects during the course of obtaining DRSP data

Table 5: Table showing comparison of scores on DRSP among patients with and without PMS on DRSP

	With PMS on DRSP (Mean, SD) (N=10)	Without PMS on DRSP (Mean, SD) (N=24)	t-test, df, p-value
WrQOL	69.90 (19.365)	81.13 (8.211)	8.143, 32, 0.022*

PSST. In our sample, the prevalence of severe PMS and PMDD was estimated at 29.4% and 6.1%. The results from our sample were significantly lower than another Indian study that was conducted in medical students, where the prevalence of PMDD was 37%.¹³ A Saudi Arabian study that studied the prevalence of PMS in college students (including medical undergraduates) found the prevalence of severe PMS at 8%, which was lower than our findings.¹⁴ A meta-analysis that was conducted using 25 studies found the prevalence of PMS to be 51.3% and PMDD to be 17.7%¹⁵ thus directly impacting personal and academic wellbeing. Objective: The impact of menstrual disturbances on academic life is not extensively explored. Therefore, the primary objective of this research was to probe the prevalence of menstrual disturbances and assess the academic and social impact. Finally, the authors provide an overview of pharmacological and other interventions students adopt to reduce clinical symptoms. Methods: A database search was conducted from the year 2016 till September 2021 for the studies reporting the prevalence of menstrual

disorders in all geographic locations of the world. Keywords used for searching databases included “menstrual disturbances” and “medical students,” “prevalence” OR “symptoms” of “Premenstrual syndrome” OR “Premenstrual dysphoric disorder” OR “Dysmenorrhea” in medical students. Prospero Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Thus, overall, the findings from our study showed a lower prevalence as compared to the previous studies. One probable reason behind this variation could be due to the variations in the tools that has been used.

In our study, the response rate in prospective data keeping was poor. Thus, it was difficult to ascertain the rates of PMDD based on prospective record keeping. In our sample 10 respondents out of 34 subjects who screened positive for severe PMS were found to have PMDD based on DRSP. However, when the data for WrQOL was compared, the students who had PMDD had significantly worse quality of life. This is supported by the findings of other studies which also depicted that PMDD is associated with worsening of quality of life across

all spheres of functioning^{8,15} the Premenstrual Syndrome Scale (PMSS). This finding is especially important when the treatment is being outlined for PMS or PMDD and strategies to mitigate the detrimental effect of quality of life should be implemented. There is also a need for early and precise identification of the problem and adequate treatment for the same.

In our sample we found that subjects who had severe PMS had a significantly higher chance of reporting another comorbid medical condition. This finding is also supported by the fact that, medical and psychiatric comorbidities are highly common in patients with PMS and PMDD.¹⁶ Studies have also proved that many of the somatic complaints that are seen in patients with PMS can actually be misdiagnosed as other medical disorders.¹⁷ Our sample also showed an association that females who had an early menarche had a higher chance of reporting of severe PMS, though the association was not statistically significant ($p=0.69$). This trend is supportive of the findings of a previous study from a Brazilian cohort who also reported that females with early menarche had a higher chance of developing PMS¹⁸ anxiety or stress, depressed mood, and affective lability. Premenstrual syndrome was defined according to intensity of symptoms. Association between age at menarche and premenstrual symptoms and syndrome were investigated through Poisson regression. Adjusted analysis was conducted, controlling for possible confounding factors. The symptoms most frequently reported by the women from the 1982 Pelotas, Rio Grande do Sul, Brazil, birth cohort who were interviewed in 2004-2005 were: irritability (52.3%).

The strengths of our study were use of a combined cross-sectional screening method followed by a prospective record, adequate sample size and use of well validated tools. Our study also investigated the association of PMS and PMDD with relevant clinical parameters which were novel. The weaknesses of our study were significant drop-outs and that DRSP was used for only a single cycle.

It can thus safely be said that PMS is highly prevalent among medical students but the truth is that it has not been studied and recognized adequately in this population. Given the demands of a modern-day medical graduate, a proper management plan should be made. More research should be invested

in the role of pharmacotherapy and other non-pharmacological management (e.g.- Yoga, exercise, etc.) in the management of PMS.

CONCLUSION

Severe PMS and PMDD was found to be prevalent in medical students among which the prevalence of severe PMS is more than that of PMDD. Presence of PMS showed relation with presence of any medical comorbidities. There is some evidence from our study that presence of PMS is related to poor work-related quality of life.

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