Original article

Premenstrual syndrom: prevalence and effect on academic and social performances of students in Jimma University, Ethiopia

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Abstract

Background: Premenstrual syndrome (PMS) is a serious problem affecting a woman's health. It affects educated women more that non-educated women. Although it has been widely studied in many countries, little, if any, is known about PMS in Ethiopia.

Objective: the main aim of the study was to determine the prevalence of PMS and its effect on the academic and social performances of students of Jimma University (JU).

Methods: A cross-sectional survey was conducted among 242 randomly selected female students of JU in Jan. 2002. A structured and pretested self-administered questionnaire was employed for data collection. The criteria proposed by the *Diagnostic and statistical manual of mental disorders* (DSM-IV) were used to diagnose PMS.

Results: The age of participants ranged from 17 to 38 years, with mean & median age of 20.3 & 20 years, respectively. Almost all (99.6%) had at least one premenstrual (PM) symptom in many of the menstrual cycles in the last 12 months. The prevalence of PMS or premenstrual dysphoric disorder (according to DSM-IV) was 27%. About 14% of the study participants frequently missed classes and 15% missed examinations or scored a lower grade at least once because of PM symptoms. Both were significantly associated with severity of symptoms ($p<0.005$). More first year students were affected by PMS than students of other class-years ($p<0.05$).

Conclusion: Our study revealed a high prevalence and negative impact of PMS on students of Jimma University. Therefore, health education, appropriate medical treatment and counseling services, as part and parcel of the overall health service, should be availed and provided to affected women. Further study is also recommended to precisely determine the prevalence of PMS using prospective methods. [*Ethiop.J.Health Dev.* 17(3):181-188]

Introduction

Premenstrual molimina, abdominal bloating and breast soreness are symptoms that are usually considered as signs of normal menstrual cycles. These symptoms may become sever and accompanied by other symptoms resulting in premenstrual syndrome (PMS).

PMS is one of the unresolved problems in spite of the fact that it has been the subject of extensive discussion and study for many years.

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The first published description of the "premenstrual tension" syndrome was by Frank in 1931. Since the original description of PMS by Frank, approximately 150 symptoms have been included in the list of possible menstrual complaints by Moos. Probably, the first report on the prevalence was in 1997 by Ruble. It was described to occur in 15-100% of women of reproductive age, with 5-10% reporting sever symtpomatology at some point in their lives with impaired social interrelationships and disrupted lives. (1). Later studies and reviews in many countries also reported similar findings (2,3).

The definition of PMS has been elusive because this condition is characterized by a wide variety

of symptoms, most of which are unmeasurable by objective standards. Dalton defined PMS as "the recurrence of symptoms in the premenstruum but complete absence of symptoms in the postmenstruum" (1), while Sutherland and Stewart defined it as any combination of emotional or physical signs and symptoms that occur cyclically prior to menstruation and then regress or disappear during or after menstruation (4).

Making the diagnosis of PMS has been problematic, since its specific etiology is unknown and there is no objective marker which can quantitate the existence or the severity of symptomatology or even the objective response to therapy. The *diagnostic and statistical manual of mental disorders* (DSM-IV) classified PMS as a mental disorder and termed it the 'premenstrual dysphoric disorder'. Our study utilized the diagnostic criteria proposed by DSM-IV to diagnose PMS (5).

PMS usually begins with menarche. It may vary in intensity, but does not resolve spontaneously, and may fade with pregnancy, oral contraceptives, menopause or inhibition of ovulation. Symptoms may also correlate with parity (3).

PMS is related to high suicide and accident rates, employment and school absentee rates, poor academic performance and acute psychiatric problems (6,7).

PMS is one of the factors that make women more susceptible than men to depression, particularly during periods of rapid fluctuation of gonadal hormones, such as premenstrually, postpartum and the climacteric (8).

Studies in different countries indicated that PM symptoms are more common and more sever among high-level educated women than non-educated women with a possible association of stress with PMS (9,10,11).

To the authors' knowledge, there is no published data on PMS in Ethiopia; at least one using standardized diagnostic criteria. This fact prompted us to conduct a baseline survey on this serious problem affecting women health, particularly of the university students who are among the promising group to the country's development. Therefore, this survey was aimed at determining the prevalence of PMS and its academic and social effects on female students of Jimma University.

Methods

A cross-sectional survey was conducted in Jimma University (JU), Jimma town, South-western Ethiopia in Jan. 2002. A sample of 242 female students was drawn from a total of 654 regular female students who enrolled to JU in the 2001/02 academic year. Proportional number of students was taken from all faculties, schools and class years. Then the study subjects were selected by systematic random sampling from each class according to alphabetical name lists. The assumptions made for sample size calculation were: a 95% confidence interval (two-sided), and expected prevalence of 50% (of PMS) to get the maximum sample size and a 5% margin error. Correction factor was applied to determine the final sample size. A structured and pretested self-administered questionnaire was employed for data collection. Data facilitators explained the meanings of terms that were found difficult by the study participants. The aim of the study was explained to each respondent. Respondents were not compelled; rather voluntary response was sought for participation. The questionnaire contains such variables as background information, gynecologic and obstetric history and questions pertaining to the presence and severity of premenstrual symptoms in the last 12 months. The later we taken from the list of symptoms in the diagnostic criteria for PMS/premenstrual dysphoric disorder of the DSM-IV and used the same criteria to diagnose PMS/premenstrual dysphoric disorder (5). Symptoms were classified as minor, moderate, sever, or extreme based on subjective reporting by the study participants. All subjects who reported their symptoms as sever or extreme were classified

to have PMS/premenstrual dysphoric disorder according to DSM-IV. Data were checked for completeness, encoded using SPSS/PC version 11.0 statistical package, summarized and analysed using descriptive statistics and the chi-square test was used to determine significance of associations.

Results

A total of 242 female students of JU enrolled into the study. The response rate was 100%. Table 1 shows the distribution of participants by faculty/school and class-year.

Table 1: **Distribution of study subjects by faculty and class year, Ju, Jan .2002**

Faculty/ school and class-year	No. (%) (n=242)
Health Sciences*	
I	19(7.9)
II	26(10.7)
Total	45(18.6)
Natural Science**	37(15.3)
Medicine	
II	6(2.5)
III	4(1.7)
IV	13(5.4)
V	5(2.1)
VI	5(2.1)
Total	33(13.6)
Social Science+	27(11.2)
Business	
II	5(2.1)
III	6(2.5)
IV	14(5.8)
Total	25(10.3)
Post basic++	
I	7(2.9)
II	9(3.7)
III	5(2.1)
Total	21(8.7)
Agriculture (diploma)	
I	15(6.2)
II	6(2.5)
Total	21(8.7)
Agriculture (Degree)	
I	9(3.7)
II	8(3.3)
Total	17(7.0)
Engineering	
II	4(1.7)
III	8(3.3)
V	4(1.7)
Total	16(6.6)

* Diploma program students in nursing, pharmacy, medical laboratory technology & environmental health.

** 1st year students who would pursue their studies in medicine, engineering or education from second semester onwards according to their choice & 1st semester results

+1st year students who would pursue their studies in business or education from second semester onwards according to their choice & 1st semester results

++Post-basic students were diploma graduates in nursing, medical laboratory technology &environmental health. After service, they joined nursing, medical laboratory technology, environmental health & public health programs to earn baccalaureate degrees after being trained for 2½ years in each area.

The age of the study participants ranged from 17 to 38 years, with mean and median age of 20.3 & 20 years, respectively. Majority of the study participants were single (92%), their menarche was at an age between 13 and 16 (74%), the usual menstrual cycle between 21 and 35 days (86%), and menstrual duration was not more than 8 days (93%). Only 9(3.7%) used oral contraceptives and only 10(4.1%) gave birth to one or more children (Table 2).

Table 2: **Background, gynecologic and obstetric characteristics of study participants, JU, Jan. 2002**

Characteristics	No (%) (n=242)
Age	
17-19	111(45.9)
20-22	97(40.1)
23-25	23(9.5)
26 and above	11(4.5)
Marital status	
Single	222(91.7)
Married	17(7.0)
Divorced	3(1.3)
Menarche	
<13 years	34 (14.0)
13-16	180(74.4)
>16	28(11.6)
Menstrual cycle	
<21 days	12(5.0)
21-35 days	209(86.3)
>35	21(8.7)
Menstrual duration	
<8 days	226 (93.4)
≥8 days	16 (6.6)
Menstrual flow	
Minimal	47(19.4)
Moderate	169(69.8)
Heavy	26(10.8)
Oral contraceptive use	
Yes	9(3.7)
No	233(96.3)
Parity	
0	232(95.9)
≥1	10(4.1)

Except one student, 241 (99.59%) reportedly had at least one premenstrual (PM) symptom in many of the menstrual cycles in the last 12 months. The most commonly reported physical premenstrual (PM) symptoms were: easy fatigability affecting 170(70.2%), appetite change in 150(61.9%), sleep change in 14(60.3%). The commonest pschobehavioral PM symptom reported by 17(73.1%) of the study subjects was decreased interest in the

usual activities like studies, lectures, friends, hobbies etc. Other most commonly reported psychobehavioral symptoms were: depressed mood by 145(59.9%), becoming easily upset by 127(52.5%) and irritability by 120(49.6%).

Ninety-six students (39.8%) reported their symptoms as minor, 80(33.2%) as moderate, 53(22%) as sever interfering daily activities and 12(5%) as extreme hindering participation in any activity (Fig.). Sixty-five (27%) of the study subjects fulfilled the diagnostic criteria for PMS/premenstrual dysphoric disorder (according to DSM-IV).

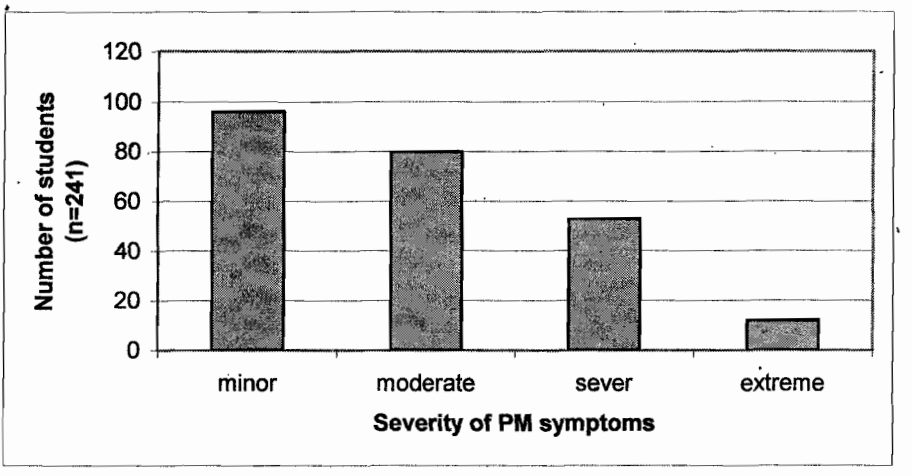

Figure 1: **Degree of severity of premenstrual symptoms reported by female students of JU, Jan. 2002**

About 14% (34 students) frequently missed classes because of PM symptoms, and 14.9% (36 students) missed examination or scored a lower grade at least once, both were significantly associated with severity of PM symptoms (P<0.005) (Table 3). Grade point average (GPA) was incompletely reported; therefore its association with PMS was not performed.

Table 3: **Relationship between severity of PM symptoms and different variables reported by female students of JU, Jan 2002**

Variable	Severity of PM symptoms (n=241)				P-value
	minor	moderate	sever	Extreme	
	No (%)	No (%)	No (%)	No (%)	
Frequent class missing					
Yes	0(0.0)	0(0.0)	25(10.4)	9(3.7)	P<0.005
No	96(39.8)	80(33.2)	28(11.6)	3(1.2)	
Exam-missing/low grade scoring					
Yes	0(0.0)	7(2.9)	23(9.5)	6(2.5)	P<0.005
No	96(39.8)	73(30.3)	30(12.4)	6(2.5)	
Remedy usage for PM symptoms					
Yes	8(3.3)	41(17.0)	32(13.3)	10(4.1)	P<0.005
No	88(36.5)	39(16.2)	21(8.7)	2(0.8)	
Treatment seeking for PM symptoms					
Yes	6(2.5)	13(5.4)	16(6.6)	4(1.7)	P<0.005
No	90(37.3)	67(27.8)	37(15.4)	8(3.3)	

PM symptoms first appeared within 2 years of menarche in 54.8% of the study subjects, while in the remaining 45.2% onset was after 2 years of menarche.

Sixty-six women (27.4%) reported that their symptoms became more sever during examination times or other stressors, and 54.8% didn't relate them to anything and the remaining 17.8% didn't know when.

Regarding remedy usage, 91(37.8%) students used remedies to relieve their symptoms. Forty-one (17%) used 'antipains', 2(0.8%) used oral contraceptives. Hot shower, hot drinks or herbal medicines were used by 17(7.1%), whereas 31 women (12.9%) didn't get any relieving remedy although they tried various modalities.

Thirty-nine (16.2%) sought treatment for their symptoms. 'Antipains' were prescribed to 22 students (56.4%) and oral contraceptives to 6(15.4%). Two of those who sought treatment were not prescribed 'medicines' and the remaining 9 students (23.1%) didn't remember what. Statistically significant association was found between severity of PM symptoms and remedy usage ($P<0.005$) as well as treatment seeking ($P<0.005$) (Table 3).

PMS varied significantly among faculties/schools. It was highest among natural science students (12/65). PMS also varied significantly among class years ($P<0.05$), first year students constituted the highest number of cases of PMS (30/65) (Table 4).

Table 4: **Severity of PM symptoms in relation to faculty, class year and age, Ju, Jan. 2002**

Variable	Severity of PM symptoms (n=241)			
	minor	moderate	sever	extreme
	No (%)	No (%)	No (%)	No (%)
Faculty school*				
Health sciences	19(7.9)	18(7.5)	6(2.5)	2(0.8)
Natural science	13(5.4)	12(5.0)	10(4.1)	2(0.8)
Medicine	15(6.2)	10(4.1)	8(3.3)	0(0.0)
Social science	19(7.9)	0(0.0)	7(2.9)	1(0.4)
Business	7(2.9)	10(4.1)	4(1.7)	4(1.7)
Post basic	7(2.9)	12 (5.0)	2(0.8)	0(0.0)
Agriculture (Dip)	4(1.7)	7(2.9)	9(3.7)	1(0.4)
Agriculture (Deg)	8(3.3)	3(1.2)	4(1.7)	2(0.8)
Engineering	4(1.7)	8(3.3)	3(1.2)	0(0.0)
Class-year**				
I	54(22.4)	30(12.4)	25(10.4)	5(2.1)
II	24(10.0)	26(10.8)	12(5.0)	2(0.8)
III	8(3.3)	6(2.5)	7(2.9)	2(0.8)
IV	8(3.3)	11(4.6)	5(2.1)	3(1.2)
V	1(0.4)	5(2.1)	2(0.8)	0(0.0)
VI	1(0.4)	2(0.8)	2(0.8)	0(0.0)
Age ***				
17-19	47(19.5)	29(12.0)	25(10.4)	10(4.1)
20-22	38(15.8)	32(13.3)	24(10.0)	2(0.8)
23-25	6(2.5)	13(5.4)	4(1.7)	0(0.0)
26 and above	5(2.1)	6(2.5)	0(0.0)	0(0.0)

* $P<0.005$
** $P<0.05$
***$P<0.005$

The age group 17 to 19 years had the largest number of cases of PMS (35/65), followed by the group 20 to 22 years (26/65) ($P<0.005$) (Table 5).

Most women with PMS were nulliparous (61/65). Similarly, most women with PMS were not using oral contraceptives (60/65), although the associations were not statistically significant in both cases ($P>0.1$).

Discussion

In our study the prevalence of PM symptoms was found to be 99.6%. This figure is higher than that reported in many studies and reviews which reported 90-95% prevalence (2,3). Cleckner et al obtained a 100% prevalence of at least one PM symptom of minimal severity among US adolescents (12).

The above reports were in the general female population of reproductive age group. Our result is in agreement with the studies conducted in Niger and Mexico in which higher prevalence of PM symptoms and higher level of education were associated (9,10).

The commonest psychobehavioral PM symptom was decreased interest in the usual activities affecting 177(73.1%) and the commonest in the physical symptom group was easy fatigability affecting 170(70.2%). The commonest physical symptoms reported by other studies were breast soreness and abdominal bloating (9,11,12), which were reportedly present in 50.5% & 36.4% of our study subjects, respectively. Irritability was cited as the commonest symptom in the study by Warner et al (11), which in our study stood sixth and affected 49.6%. Food craving was the commonest symptom among US adolescents (12), which occurred in 6.2% of our study subjects.

Overall, psychobehavioral symptoms were more common than physical symptoms McMaster et al found similar results among educated professional women than domestic workers in Zimbabwe (13).

PM symptoms first appeared within two years of menarche in 54.8% of the students; this is in accordance with a review that stated their occurrence with menarche (3). About 40% rated their symptoms as minor, 33.2% as moderate, 22% as sever and 5% as extreme, and 27% fulfilled the diagnostic criteria for PMS/premenstrual dysphoric disorder (according to DSM-IV). This is much higher than many reviews, which reported in the range of 5-10% (1,2,3). In the study conducted among US adolescents, 73% considered at least one PM symptom as sever and 56% as extreme (12). As it was discussed earlier, this higher prevalence of PMS in our study than many of the studies in the general population may be related to higher degree of stress that university students may face (9,10,11). Cenac et al reported prevalence of 43% in literate Niger women in contrast to 21% in illiterate women (9). Note that their report was based only on subjective reporting of symptoms rather than using the DSM criteria.

There were statistically significant variations of PMS with faculty/school ($p<0.005$) and class-year ($p<0.05$). Nearly half of the cases of PMS were among first year students (30/65), and first year natural science students constituted the highest number of cases of PMS (12/65). Most of these first-year students were in the age group of 17 to 19, which may be the reason why the largest number of cases of PMS was observed in this age group (35/65). First-year students were probably at much more academic stress as they didn't choose their future field of study and work hard to get their career.

No specific symptom group was indicative of sever PM symptoms. Except suicide ideation; all the other symptoms, alone or in the presence of other symptoms were reported as minor, moderate, and as sever or extreme in the presence of additional symptoms, while the former was uniformly reported as either sever or extreme.

Those students with sever or extreme symptoms frequently missed classes or missed

examinations or scored a lower grade at least once. Because some students didn't report their grades, the association between grade and PMS could not be performed.

Remedy usage and treatment seeking were related to severity of PM symptoms. However, majority of students with PMS didn't seek treatment (45/65), either because they might be fearful to seeking treatment for menstrual and related problems due to cultural or other reasons (13), or treatment facility was not readily available.

The commonly used remedy was 'Antipain'. In a survey that was carried out in the US, 'painkillers' were the most commonly used (14). 'Antipains' were also found to be the most commonly prescribed to those who sought treatment. The same medicines were the most commonly prescribed in the aforementioned US survey (14).

Oral contraceptives were used by and prescribed to only 2(0.8%) & 6(15.4%), respectively. Oral contraceptives are probably considered by many women solely as one of the family planning methods without other benefits. Therefore, they seem to be reluctant to use them for PM symptoms even when prescribed by a physician, although our study design didn't allow reaching at a conclusion on this point.

Warner & Bancroft found significant association between oral contraceptive use and lower prevalence of PM symptoms (11). Such association was not obtained in our study, probably because of the relatively few students who used oral contraceptives (3.7%), as they were not sexually active or were using other contraceptive methods.

Warner & Bancroft also reported lower prevalence of PM symptoms among parous women (11), but we didn't find such association, probably because many of the students were nulliparous (95.9%).

In conclusion, the prevalence of PM symptoms in general and PMS/ premenstrual dysphoric disorder in particular was very high among JU students. The commonest physical PM symptom was easy fatigability and the commonest psycho behavioral symptom was loss of interest in the usual activities. Overall, psycho behavioral symptoms were more common than physical symptoms among JU students. Sever symptoms had negative impact on academic and social performances of the students. Therefore, health education, appropriate medical treatment and counseling services, as part and parcel of the overall health service, should be availed and persistently provided to affected women. Further study is also recommended to precisely determine the prevalence of PM symptoms and PMS using prospective methods. Other more comprehensive studies are required before recommending academic privileges to female university students, particularly in regard to first year students.

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