

Full Length Research

Prevalence of premenstrual syndrome and associated functional disability among female students of Addis Ketema preparatory school, Ethiopia

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Premenstrual syndrome is a psycho-neuro-endocrine disorder having biological, psychic and social parameters. It is a serious health problem affecting the young females and any women in a reproductive age group. The recurrent nature of this problem has potential impact on the daily lives of women; making a central issue in women well-being. Although it has been widely studied in many countries only limited studies have been conducted in Ethiopia and the study area in particular. To determine the prevalence and severity of premenstrual syndrome and functional disability associated among female students of Addis Ketema preparatory school. Cross-sectional study was conducted to determine the prevalence and severity of premenstrual syndrome and associated functional disability among female students. A total of 210 sampled female students were included in the study. The information for the study was collected by a pre-designed self administered questionnaire by reviewing literatures. The diagnosis of premenstrual syndrome was done according to American College of Obstetrics and Gynecology premenstrual syndrome clinical management guideline for Obstetrician. Assessment of the severity was determined using Taylor D. premenstrual syndrome scoring technique symptom management. Data analysis was done by SPSS version 19.0 computer statistical soft ware. One hundred eighty female students completed questionnaire making a response rate of 85.7%. one hundred fifty five(86.1%) reported to have experienced premenstrual syndrome, out of which 71 (41.3%) had mild, moderate 47(27.3%), severe 29 (26.9%) and extremely severe (3.5%) forms of premenstrual syndrome. premenstrual syndrome for most of them started at their age of menarche (45.9%). 73% reported that the symptoms have interfered and decreased their daily activity. Eighty nine (49.4%) reported to have changed their diet (10.5%) used analgesics and exercise (3.9%) as coping mechanism to relieve the symptoms. Statistical significant association was observed between occurrence of premenstrual syndrome and academic year ($p < 0.05$). The prevalence of premenstrual syndrome is high among the studied female students. Even though nearly half of them used some form of coping mechanism, the symptoms have interfered their daily activity. There is significant association between occurrence of premenstrual syndrome and their academic activities. Identifying and providing appropriate medical treatment and counseling for the female students at school clinics needs to be considered. Information education communication on premenstrual syndrome and possible coping method should be provided at schools.

Key words: Premenstrual syndrome, Prevalence, Functional disability.

INTRODUCTION

Premenstrual syndrome (PMS) is a psycho neuro-endocrine dysfunction with constellation of regular,

recurring, psychological or somatic complaint, or both, that occur specifically during luteal phase of menstrual cycle, and that resolve by the onset of or during menstruation (Ellis and Younkic, 2004). Premenstrual dysphoric disorder is a more sever type of PMS where the psychological and behavioral symptoms of labile and

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depressed mood, anger, irritability and internal tension are prominent (Sil Tschudin *et al.*, 2010; Tenkir *et al.*, 2003).

PMS is used to describe an array of predictable physical, cognitive, affective and behavioral symptoms that occur cyclically during the luteal phase of the menstrual cycle and resolve quickly at or within a few days of the onset of menstruation (Redmond, 2007). Premenstrual dysphoric disorder (PMDD) is a severe form of PMS where the psychological and behavioral symptoms of labile and depressed mood, anger, irritability and internal tension are prominent (Sil Tschudin *et al.*, 2010; Mortola *et al.*, 1989; Fisher *et al.*, 1989). 3 - 8% of women, have symptoms that are very severe, causing functional impairment that adversely affect quality of life and are classified as PMDD (Mishesll, 2005; ACOG, 2007; Alan, 2007; Yonkers *et al.*, 2008).

The high prevalence of PMS and their impact on women's quality of life has been an ongoing concern for patients and their physician. Because the symptoms are so varied, and because no specific endocrine diagnostic test exists, PMS may go unrecognized or be misdiagnosed as another condition (Daniel, 2005). PMS interferes with a women's quality of life. It can have both direct and indirect economic consequences. Direct costs take the form of fees for outpatient office visits, laboratory tests and treatment. Indirect costs, which are considerably more difficult to quantify, are usually viewed in terms of lost productivity at work (Daniel, 2005). It is also related to high suicidal and accident rate, unemployment and school absentee rates, poor academic performance and acute psychiatric problems (Becarica, *et al.*, 1998).

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 premenstrual, post partum and the climacteric (Young and Kroszun, 1998). Studies indicated that PMS is common and more severe among high level educated women than non-educated ones with a possible association of stress with PMS (13-218). A study conducted in India identified this problem mostly among teenage girls in the age range of 13 - 15, where over one third (35.9%) premenstrual symptoms recorded. The common symptoms reported include: sleep disturbance and decreased appetite as a major complaint followed by missed a class and abstained from work (Pragya *et al.*, 2008). Some studies also reported the PM symptoms to be common problem and more severe among educated women than non-educated ones with a possible association with stress (Marvan, 1998; Johnson, 1987; Warner and Bancroft, 1990; Faze, 2008).

Oral contraceptive use was also reported to be associated to PM symptoms than non-users, especially among nulliparous (Warner and Bancroft, 1990). In addition there is a general trend for premenstrual

syndrome to increase in prevalence with increasing age (Tenkir *et al.*, 2003; Ktarner and Bancroft's, 1990).

Study among Jimma University female students showed that almost all (99.6%) had at least one PM symptoms in the last 12 months. About 14% of the study participant missed classes and 15% missed examination or scored a lower grade at least once because of the symptoms (Tenkir *et al.*, 2003). PMS interferes with day to day activity of women's life. In a study done in India, it has been reported that daily routine of 60% of the studied girls were affected due to prolonged bed rest, missed social activities /commitments, disturbed sleep and decreased appetite. 17.4% had missed class and 25% had to abstain from work (Prayya *et al.*, 2007; Chenchit and, Mancc, 2003). On the other hand a study on Thai nurses concluded that prevalence of PMS in nurses with younger age, nulligravida, lower income, more coffee consumption, dysmenorrheal and negative attitude towards menstruation (Waztt, 1999; Nuluter *et al.*, 2010). The prevalence of PMS is different in different countries which may indicate its multi factorial nature. A research done in King Faisal University, Saudi Arabia showed prevalence of PMS in 35.6% of cases, distributed as 45% mild, 32.5% moderate and 22.4% severe. The prevalence of anxiety and depression was statistically more evident in the PMS group. Regression analysis revealed that, PMS was significantly associated with older age groups, rural residence, lower age at menarche, regularity of menses and family history (Magdy *et al.*, 2010). Although PMS has been widely studied in many countries only limited studies have been conducted in Ethiopia. Therefore this study was intended to provide information on the prevalence of PMS and associated factors and effects.

METHODS AND MATERIALS

Study area and Period: The study was conducted in Addis Ketama preparatory school Addis Ababa in the month of May 2012. Addis Ketama preparatory school contains a total of 2797 students out of which 1480 are females during the academic year 2011/12. There is one Red Cross clinic in the school which gives emergency services.

Study Design: cross-sectional study design

Source population: All [N=1480] female students enrolled in Addis Ketama preparatory school during academic year 2011/2012.

Study Population: a sample of 210 female students selected from the source population. The sample size was calculated assuming a prevalence of PMS to be 70% - 90%, taking 0.05 margin of error, 95% CI. For the total

population were below 10, 000, it was adjusted and the final sample size was 210.

Data collection: A self administered questionnaire was used to collect the information. Data collection was monitored and supervised by the principal investigator. The severity of the symptoms was scaled according to Taylor (1999) severity scoring technique. The overall information collected included dependent variables as PMS and Severity of PMS, while the independent variables included socio-demographic variables such as age, Religion, Ethnicity and Parity.

Measurement: The diagnosis of PMS was made according to ACOG, and to establish the diagnosis: Symptoms relieved within 4 days of menses onset without recurrence until at least cycle day 13 (Redmond, 2007); Symptoms present in absence of any pharmacologic therapy, hormone ingestion, or drug or alcohol abuse; Symptoms occur reproducibly during 3 cycles of prospective recording; Patient suffers from identifiable dysfunction in social or economic performance and the severity of PMS was scored according to Taylor severity scoring technique (Taylor, 1999).

Data analysis: The collected data was analyzed using SPSS version 16.0 program and the results presented by tables and figures. Frequency distribution by percentage, mean and median was calculated and statistical associations using chi-square test (χ^2) was used where applicable.

Operational Definition

Premenstrual syndrome: - is a psycho neuro endocrine disorder, diagnosed with the presence of at least one of the affective symptoms in each of ≥ 3 consecutive menstrual cycle with other medical and psychological condition excluded.

Affective symptoms:

- i. Anger/irritability (quick excitability to annoyance, impatience or anger)
- ii. Anxiety (nervous felling caused by fear that something bad is going t happen.)
- iii. Depressed moods
- iv. Tension (inner striving, unrest or imbalance often with physiological indication of emotion.)
- v. Decreased interest and difficult in concentrating
- vi. Sleep disturbance and eating disorder

Premenstrual symptom of severity scaling according to Taylor (1999) severity scoring technique was taken as

follows.

Mild symptoms: Feeling of symptom, or behavior but does not interfere with activities or make her feel distressed.

Moderate symptoms: affecting work, the way felt or ability to function, but even though there is feeling of somewhat distressed, and able to carry on with usual activities.

Severe symptoms: PMS that limit or interfere with daily activities and feeling of distress that prohibit one to do what she want to do.

Extreme symptoms: feeling very distressed by the symptom or behavior; and not doing anything, but staying in bed.

RESULTS

Out of the sampled female students 180 of them responded to the questionnaire making a response rate of 85.7%. The majority 152 (84.5%) were in the age group of 15 -20 years, 76 (42.2%) were in grade 11 and 104 (57.8%) were in grade 12. Fifty five (30.6%) were Amhara, 66 (36.7%) Oromo and 42 (23.3%) were Tigray. 97 (53.9%) were Orthodox Christians followed by Muslims 42 (23.3%). The majorities were 176 (98.9%) and none of them had pregnancy experience. One hundred thirty nine of them came from urban area and the rest 41 (8.1%) were from rural areas. 155 (86.1 %) reported to have experienced PMS in their life time. One hundred one (61.7%) started to have menses between the age of 10 and 14 and 69 (38.3%) started at age of 15 and above. The average at menarche was 14.5 years. 125 (69.4%) reported that their menses comes regularly, 54 (30%) reported menstrual irregularity (Table 1).

Premenstrual symptom started from menarche in 87 (48.3%) of the respondents, while 61 (33.9%) reported that no special event had triggered their PMS symptom and 23 (12.8%) blamed different social events before experiencing symptoms.

Seventy one (41.3%), 47 (27.3%), 29 (26.9%) and 6 (3.5%) reported to have experienced mild moderate, severe and extremely severe form of pre menstrual symptom respectively (Table 2).

Decreased interest on daily activity was the most common symptom reported by 127 (73.8%) followed by depressed mood 126 (73.2%) and abdominal bloating 123 (71.5%). Forty six (25.6%) of the respondents noticed change in severity. From those who reported stress as an aggravating factor 57 (31.1%) and 18 (10.0%) of them responded that different social events and emotional changes aggravated their premenstrual

Table 1. Socio-demographic characteristics and Menstruation history of AKPS female students May 2012.

Socio – demographic characteristics	Number	Percent
Age		
15-20	152	84.5
21-25	28	15.5
Class year		
Grade 11	76	42.2
Grade 12	104	57.8
Ethnicity		
Oromo	66	36.7
Amhara	55	30.6
Tigray	42	23.3
Others	17	9.4
Religion		
Orthodox	97	53.9
Muslim	42	23.3
Protestant	28	15.6
Marital status		
Single	178	98.9
Married	2	1.1
Upbringing		
Rural	41	22.8
Urban	139	77.2
Age at menarche (years)		
11-14	111	61.7
≥15	69	38.3
Status of menses		
Regular	125	69.4
Irregular	54	30.0
Amenorrhoea	1	0.6

Table2. Distribution of premenstrual symptoms among among the studied subjects. Addis ketema preparatory school , May 2012.

Pre menstrual symptoms experienced	Mild No(%)	Moderate No(%)	Sever No%	Extreme No%
Anger/irritability	41(22.8)	28(15.6)	5(2.8)	10(5.6)
Anxiety	50(27.8)	31(17.2)	15(8.3)	8(4.4)
Depressed mood	66(36.7)	52(28.9)	40(22.2)	18(10)
Tension	30(16.7)	26(14.4)	16(8.9)	11(6.1)
Decreased interest on daily Activities	69(38.3)	25(13.9)	16(8.9)	12(6.7)
Difficulty concentrating	42(23.3)	34(18.9)	21(11.7)	5(2.8)
Fatigue/lack of energy	71(39.4)	55(30.6)	13(7.2)	7(3.9)
Overeating/food cravings	24(13.3)	11(6.1)	6(3.3)	2(1.1)
Sleep disturbance	31(17.2)	14(7.8)	9(5.0)	4(2.2)
Feeling over whelmed or Out of control	27(15.0)	17(9.4)	8(4.4)	1(0.6)
Physical – Breast tenderness	77(42.8)	53(29.4)	38(21.1)	11(6.1)
Headaches.	90(50.0)	66(36.7)	44(24.4)	15(8.3)
Abdominal bloating	76(42.2)	48(26.7)	20(11.1)	7(3.9)
Joint/ muscle pain	23(12.8)	13(7.2)	4(2.2)	0(0.0)
Weight gain	14(7.8)	10(5.6)	5(2.8)	0(0.0)
Swelling of extremities	6(3.3)	2(1.1)	0(0.0)	0(0.0)

Table 3. Change in severity, aggravating factors and coping methods of PMS among studied female students, Addis ketema preparatory school May 2012.

Variables	Number	Percent
Change in severity		
Yes	59	32.8
No	121	67.2
Aggravating events		
Social events	18	10.0
Stress	57	31.7
None and Others	105	58.3
Coping methods		
Change in diet	63	35
medicine	19	10.5
Exercise	7	3.9
None	91	50.6

Table 4. Distribution of PMS by selected socio-demographic characteristics and PMS status among studied female students, Addis ketema preparatory school May 2012.

Variables	PMS		Total	P- value
	Yes n(%)	No n(%)		
Class year				
Grade 11	59(77.6)	17(22.4)	76	0.01
Grade 12	96(92.3)	8(7.7)	114	
Marital status				
Single	153(86.0)	25(14.0)	403	0.25
Married	2(100)	0(0.0)	3	
Up bringing				
Rural	35(85.4)	6(14.6)	41	0.25
Urban	120(86.3)	19(13.7)	139	
Status of menses				
Regular	112(89.6)	13(10.4)	125	0.1
Irregular	43(79.6)	11(20.4)	54	
Amenorrhic	0(0.0)	1(100.0)	1	

symptom (Table 3).

Among the study subjects 91 (50.6%) not used any of coping method. 63 (35%) used change in diet, 19 (10.5%) used medication (analgesics) and 7 (3.9%) used exercise as coping mechanism. Among study subjects 87 (48.3%) missed less than 5 classes, 53 (29.4%) missed 5-10 classes and 18 (10%) missed more than 10 classes in the past 6 months. Only one student missed more than 3 exams in the past 6 months while 7 (3.9%) missed one exam and 3(1.7%) missed two exams in the past 6 months. Students in grade 12th (92.3%), singles (86.6%), urban up brought (86.3%), reported to have experienced PMS. Marital status, upbringing and menstrual status have no significant association with PMS ($p>0.05$) (Table 4).

Seventy one (39.4%) faced more than 10 days of difficulty of studying in the past 6 months while 58 (32.2%) faced 5 - 10 and 44 (24.4%) faced less than 5 days of difficulty of studying in the past 6 months because of the symptoms (Table 5 and Figure 1).

DISCUSSION

In this study over three fourth of the study participants reported pre menstrual symptom which is comparable with the study done in Switzerland Basel University hospital, which showed a prevalence of 91%. This finding is also in agreement to the study reported among Jimma University female students. But it is much higher than

Table 5. Functional disability in academic performance among, studied female students, Addis ketema preparatory school May 2012.

Variables	Frequency	Percent
Classes missed in the last 6 months in days		
<5	87	48.3
5-10	53	29.4
>10	18	10.0
Exams missed in the last 6 months		
1	7	3.9
2	3	1.7
>=3	1	0.6
Difficulty of study in the last 6 months		
<5	44	24.4
5-10	58	32.2
>10	71	39.4

what is reported in a research done in Nigeria University which showed a prevalence of 50.1%. The figure is also higher than that reported and in current diagnosis and treatment of Obstetrics and Gynecology as well as the research done in King Faisal University which is 50.% and 75% prevalence respectively (3, 18), This difference may be the result of difference in study population in which in our case almost homogenous study subjects were involved.

Similar different studies conducted so far on prevalence of PMS have used specific groups as college students or volunteers making their utility for the general population questionable (Daniel , 2005; Marvan, 1998; Warner and Bancroft 1990; Magdy *et al.*,2010 Waztt, 1999; Prayya *et al.*, 2008; Nuluter e., 2010). Some studies reported that PMS is more common among literate women than illiterate with possible association of stress (Warner and Bancroft, 1990; Ktarner, 1990). The prevalence is also higher among nulli parous. The high prevalence of PMS in this study could be ascribed to study subjects literacy status and associated stress, there is also strong association between their academic year, which further supportd the association between the level of stress and prevalence of PMS. But it is difficult or impossible to compare between literate and illiterate since the study subjects are homogeneous. All of the study subjects were nulliparous and this may contribute for the high prevalence among the study subjects as also reported elsewhere (Tenkir *et al.*, 2003; Daniel, 2005; Levine and O'connor, 1985; Waztt, 1999; Magdy *et al.*, 2010).

In this study, about three fourth subjects reported decreased interest on daily activity (76.4%) as the most common symptom which possibly affected their day to day academic performance. Other common symptoms reported include depressed mood, abdominal bloating and fatigue/lack of energy, which is in agreement with the study finding reported in Nigeria (Magdy *et al.*, 2010).

Study conducted in King Faisal University showed significant association of PMS among older age group, rural residency and regularity of menses (Lazarus, 1975), but in this study there was no association observed with menstrual regularity and this could be because of small size of our study subjects and their homogeneity. There is also no statistical association was observed between upbringing or residence and PMS in this study. This study showed 42.6% of the study subjects with PMS had mild (26.3%) moderate (16.2%) severe and very severe (3.9%) symptoms, which is more or less comparable with the report in King Faisal University ((Lazarus, 1975), but it is difficult to conclude since PMS lacks definitive criteria that is universally accepted for these two studies used different scoring system.

Most of the respondents started to have menses at the age of 10 and 14 years and 48.3% started to have PMS starting from menarche, which is more or less comparable with the report in Current diagnosis and treatment (Tenkir *et al.*, 2003). About one fourth (25.6%) of the study subjects with PMS have noticed change in severity of their symptoms, out of which 31.7% reported that stress aggravates their symptom while 10% of them associated their change in severity with different social events like disagreement and being away from family. A similar study conducted in UK showed that oral contraceptive pill use to significantly decrease the likelihood of reporting PMS. This study showed no use of oral contraceptive pill, which may affected the increase in prevalence of PMS in this study (Daniel, 2005; Wazne and Zev, 1993).

Although no single intervention is effective for all women's with PMS; females with moderate and severe symptoms need medical intervention (Young and Kroszun, 1998). In this study 49.4% of students with PMS use coping method to relive their symptoms, where the majority of this used change in diet and medication as

analgesics, which is consistent with study report in USA (Warner and Bancroft, 1990).

In conclusion, the prevalence of PMS was high among the studied female students; the commonest symptom being decreased interest on daily activities which may negatively affect their day to day learning activity. Most study subjects with PMS started to have the symptoms at the start of their menarche. Almost half of the study subjects missed 1- 4 classes in the past six months. No significant association was found between PMS and marital status, upbringing or menstrual regularity. Almost half of the study subjects with PMS used coping method and most of these use change in diet to relieve their symptom. Therefore, Health information on PMS and possible coping methods should be provided for AKPS females club and during female meetings. AKPS red cross clinic should provide appropriate medical treatment and counseling for affected female students. Further study using prospective design and controlling for other confounding factors like organic diseases and other affective disorders is recommended to precisely determine the severity of PMS and its effect on daily life of women.

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