Premenstrual Syndrome: Prevalence, Pattern and Severity Among Female University Students in Ekpoma, Nigeria

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Abstract

Context: Premenstrual syndrome (PMS) is a common but still poorly understood cyclical disorder of women in the reproductive age. Prevalence figures vary widely reflecting differences in modes of assessment and population sampled. It has been found to be more common and severe among well educated women with a possible association with stress. The female student population of Ambrose Alli Uuniversity, Ekpoma thus typifies a population at risk of this disorder.
Objective: To determine the prevalence, pattern and severity of PMS as well as perception and treatment seeking behaviour of the study population.
Methods: This was a descriptive cross-sectional survey conducted among female undergraduates of Ambrose Alli University, Ekpoma, Edo State, in order to assess the prevalence and severity of symptoms of the premenstrual syndrome (PMS) among them. Four hundred and four (404) respondents selected using the cluster sampling technique completed self-administered questionnaires distributed to them.
Results: PMS diagnosed using the ICD 10 criteria, was found in 94.8% of the study group. The common symptoms were abdominal pain/discomfort, breast pain/swelling, fatigue, irritability and decreased interest in usual activities. The least frequent symptoms were crying spells and suicide ideation. Analgesics were the most commonly used form of remedy (48.8%) while only one respondent (0.3%) used the oral contraceptive pill specifically as a remedy for PMS. There was a statistically significant association between severity of symptoms and treatment between the age of respondents and use of oral contraceptive pills with severity of symptoms.
Conclusion: PMS is a very common but poorly understood condition in our environment. More local studies are advocated on this subject as well as increased public enlightenment to enhance the effective management of this condition.
Key Words: Premenstrual syndrome, prevalence, severity.

Introduction

Premenstrual Syndrome (PMS) is a common cyclical disorder of young women which has psychological, behavioural and physical components and may seriously affect a woman's health. This disorder though extensively researched has continued to present difficulties with regards to definition, aetiology, diagnosis and efficacy of treatment[1,2,3].

The first published description of this syndrome as the "premenstrual tension" was by Frank[4] in 1931 but the term "premenstrual syndrome" was first used in 1953 by Greene and Dalton[5]. Various definitions of this condition abound in the literature. Dalton defined PMS as 'the recurrence of symptoms in the premenstrum but complete absence of symptoms in the postmenstrum'[6]. Sutherland and Stewart define it as "any combination of emotional or physical signs and symptoms that occur cyclically prior to menstruation and regress or disappear during or after menstruation"[7]. PMS is defined by the National Institute of Mental Health as "the cyclic occurrence of symptoms that are of sufficient severity to interfere with some aspects of life and which appear with consistent and predictable relationship to menses"[8]. Multiple definitions

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notwithstanding, there is a general acceptance of the fact that this condition is recurrent and cyclical, occurring in the luteal phase and of sufficient severity as to interfere with work, relationship and lifestyle[9, 10, 11, 12].

The severe form of PMS was defined and operationalized by the American Psychiatric Association. It was initially termed the Late Luteal Phase Dysphoric Disorder (LLPDD) in the 3rd edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R) [13] and later included in the 4th edition (DSM-IV) [14] as the Premenstrual Dysphoric Disorder (PMDD).

The aetiology of the symptom complex of PMS is not known although several theories have been proposed including oestrogenprogesterone imbalance, hyperprolactinaemia, hypoglycaemia, excess aldosterone and psychogenic factors[1, 15]. It appears that natural ovarian cyclicity is a prerequisite for PMS and this is supported by the efficacy of ovarian cyclicity suppression either medically, or surgically, in causing resolution of symptoms[16, 17, 18]. Gonadal hormones are thought to influence the activity of neurotransmitters especially serotonin. Generally, decreased levels of gonadal hormones are associated with decreased serotoninergic activity[2]. Central serotonin levels are typically low in women with PMS/PMDD and many women report benefiting from Selective Serotonin Reuptake Inhibitors (SSRIs) [1,2,19].Other neurotransmitters implicated include GABA and

B- endorphin though their role is less defined[2]. Attempts to link vitamin and mineral deficiencies to PMS/PMDD have been inconclusive[20, 21].
Prevalence studies on PMS have revealed a wide range, reflecting differences in modes of assessment and population sampled. Some reported prevalence figures are 15-100%[6], 40-95%[11], and 75%[1, 20]. On the African continent, a prevalence of 95.5% was reported among nurses in Nairobi[22] and 99.6% among university students in Ethiopia[23]. Prevalence studies on PMS have been very few in Nigeria. Antai et al[24] reported a prevalence of 85.5% among university undergraduates in Calabar, while Fakeye and Adegoke[25] found severe PMS in about 20% of post menarcheal secondary school girls in Ilorin. The prevalence of PMDD is 3-8%, with the vulnerable years being the late 20's and early 30's. Since its first description, a large constellation of symptoms (over 150) have been related to the PMS, most of which are non-specific and immeasurable by objective standards. Some of the symptoms of PMS actually represent physiologic and behavioural changes associated with a normal menstrual cycle.

Symptoms like breast tenderness, bloating, mood changes and lower abdominal cramps are components of the premenstrual molimina, which characterize ovulatory cycles. PMS may well be a severe form of this normal physiologic pattern[23, 26, 27].

Table 1: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS.

VARIABLE	N=404	PERCENTAGE (%)
AGE (in years)		
<20	47	11.6
20-24	233	57.7
25-29	117	29.0
30-34	7	1.7
MARITAL STATUS		
Single	380	94.1
Married	24	5.9
PARITY		
0	386	95.5
1	12	3.0
2	6	1.5
RELIGION		
Christianity	398	98.5
Islam	6	1.5

TABLE 2: FREQUENCY OF PMS SYMPTOMS AMONG RESPONDENTS

SYMPTOM	FREQUENCY (N=404)	PERCENTAGE (%)
Abdominal pain/discomfort	375	75.5
Breast pain / swelling	236	58.4
Fatigue	175	43.3
Irritability	173	42.8
Decreased interest in usual activities	167	41.3
Hypersomnia /Insomnia	159	39.4
Depressed mood	141	34.9
Impaired concentration	129	31.9
Headache	110	27.2
Abdominal bloating	101	25.0
Muscle/joint ache	100	24.8
Anxiety/tension	97	24.0
Feeling overwhelmed	92	22.8
Increased appetite /food cravings	91	22.5
Oedema /weight gain	86	21.3
Crying spells	57	14.1
Suicide ideation	22	5.4

Making the diagnosis of PMS has been problematic since its specific aetiology is unknown and there is no objective marker to quantify the existence or severity of symptomatology, as well as objective response to therapy. In the WHO International Classification of Diseases, 10th Edition (ICD-10)[28], PMS is listed as a physical disorder and there is no requirement for a minimum number of symptoms or functional Impairment to make a diagnosis of PMS. PMDD as a diagnosis using the DSM-IV criteria has an identical physical symptom list with PMS. However, more emphasis is placed on the emotional and behavioural symptoms, which are significantly more serious with PMDD and go far beyond what are considered manageable or normal premenstrual symptoms.

Treatment of PMS aims to relieve symptoms and restore function, and often requires a combination of lifestyle modification and drug therapy. Frequently used remedies include oral contraceptives, serotonin reuptake inhibitors, antidepressants, anxiolytics, progesterone, diuretics, vitamins B_6 and E, calcium, magnesium and herbal products. Exercise, eating smaller, more frequent meals and reducing consumption of sugar, salt, caffeine and alcohol are also advocated[1, 2, 20].Efficacy of these treatment modalities vary, while studies have demonstrated a beneficial effect with some of these remedies, reports on others have been conflicting[1, 2, 20, 29].

The psychosocial components of this disorder as well as inherent diagnostic problems make denial, misdiagnosis and poor treatment quite common. Most women with PMS are able to perform their day-to-day activities. However, in its severe form, this disorder has been associated with increased absenteeism from school and work, poor academic performance, high suicide rates and increased crime rate[30, 31]. Studies have indicated that PMS is more common and more severe among well educated women than uneducated women with a possible association of PMS with stress[32,33]. Ambrose Alli University, Ekpoma, with a large number of female students in their 20's and 30's, exemplifies a population particularly at risk of premenstrual syndrome.

This study seeks to determine the prevalence of PMS among female undergraduates of Ambrose Alli University, Ekpoma; document the pattern and severity of the symptoms, the perception of this condition, as well as treatment seeking behaviour of the affected population. This will result in better understanding of this condition in our environment and enable health care providers manage affected patients more satisfactorily.

TABLE 3:   SEVERITY OF PMS SYMPTOMS IN AFFECTED RESPONDENTS.

SEVERITY	N = 383	PERCENTAGE (%)
Mild	190	49.6
Moderate	143	37.3
Severe	27	7.1
Extreme	23	6.0

Materials and Methods

This was a descriptive cross sectional survey conducted at the Ambrose Alli University, Ekpoma. The university is located in Ekpoma, Esan Local Government Area of Edo State, Nigeria, with a female undergraduate student population of 4,826. A sample size of 370 female undergraduates was picked based on the formula: $nf = {}^{n}/_{1+ (n)}/_{(N)}$. Where: nf = the desired sample size when the population is less than 10, 000, n = the desired sample size when the population is more than 10,000 (400), N = the estimated population size (4, 826). Four hundred and fifty (450) Questionnaires were prepared to compensate for anticipated non-response and respondents were selected using the cluster sampling technique. A pre-tested, structured self-administered questionnaire was employed for data collection. This contained variables such as demographic characteristics and gynaecologic history of respondents. It also included questions pertaining to the presence, extent and severity of known premenstrual symptoms experienced regularly over the past 6 menstrual cycles. Premenstrual syndrome was diagnosed using the WHO-ICD 10 criteria. Perception, treatment-seeking behaviour and remedy usage among respondents were also assessed. Data was analysed using Microsoft excel and EPI-info 2004 software packages. Significance of associations was determined using the chi-square test, a p-value <0.05 was taken as being significant.

Results:

A total of 450 questionnaires were distributed. Thirty (30) questionnaires could not be retrieved, 16 questionnaires were inadequately completed and were excluded, leaving a total of 404 questionnaires (89.8%) for analysis. The 404 respondents were distributed among nine faculties of the University. The Social Science and Natural Science faculties had the highest number of respondents (28.5% and 22.5% respectively), while the faculties of Agriculture and Engineering had the least number of respondents (1.5% each).

The age of the study population ranged between 16 and 33 years with a mean age of 22.9 3.4 years. More than half (57.7%) of the study participants were aged between 20 and 24 years while only 7 (1.7%) were aged 30 years and above as shown in Table 1. Majority were single (94.1%), nulliparous (95.5%) and Christians (98.5%). In addition, mean age at menarche was 13.8 0.65 years with a range of 10-20 years. About 90.6% had a normal menstrual cycle length between 21 and 35 days and 97.8% had a normal duration between 2 and 8 days. Only 48 (11.9%) were using oral contraceptive pills as a method of family planning.

Of the 404 respondents whose questionnaires were analysed, 11(2.7%) had no premenstrual symptom, 10(2.5%) had premenstrual symptoms which persisted beyond one week of the follicular phase of the menstrual cycle and could therefore not be classified as true PMS. Premenstrual syndrome diagnosed using the ICD-10 criteria, was found in 383 respondents, giving a prevalence of 94.8%.

Table 2 shows the frequency of various symptoms of PMS among the study participants. The most common symptoms were Abdominal pain or discomfort affecting 375 (75.5%), breast pain or swelling in 236(58.4%), fatigue in 175(43.3%), irritability affecting 173 (42.8%), and decreased interest in usual activities affecting 167 (41.3%). The least common symptoms were oedema/weight gain in 86 (21.3%), crying spells in 57 (14.1%) and suicide ideation in 22 (5.4%).

Table 3 is a classification of the severity of premenstrual symptoms based on subjective reporting by the respondents who had PMS. One hundred and ninety (49.6%) reported their

Table 4: PERCEPTION OF PMS, TREATMENT-SEEKING BEHAVIOUR AND REMEDY USAGE AMONG AFFECTED RESPONDENTS.

CHARACTERISTIC	N = 383	PERCENTAGE (%)
PMS is an illness	67	17.5
PMS is a normal part of womanhood	316	82.5
Treatment sought for PMS symptoms	133	34.7
Remedy used for PMS symptoms	211	55.1
PLACE OF TREATMENT		
Patent medicine dispenser	78	20.4
Hospital	55	14.3
TYPE OF REMEDY USED***		
Analgesic	187	48.8
Antispasmodic	42	11.0
Herbs	3	0.8
Antibiotic	2	0.5
Oral contraceptive pills	1	0.3
RELIEF AFTER REMEDY USAGE	194	50.7

*** Some respondents used more than one form of remedy

symptoms as mild, having little or no effect on their usual activities, 143(37.3%) and 27(7.1%) had moderate and severe symptoms respectively, while 23(6.0%) reported their symptoms as extreme, hindering participation in any activity. Table 4 summarizes respondents' perception of PMS, their treatment seeking behaviour as well as use of various remedies for the treatment of this condition. Only 67 respondents with PMS (17.5%) considered it to be an illness while 316(82.5%) viewed the condition as a normal part of womanhood. One hundred and thirty three (34.7%) had specifically sought treatment for PMS, and 211 (55.1%) admitted using one form of remedy or the other for the condition. Seventy eight (20.4%) consulted the patent medicine dispenser ("chemist") while 55 (14.3%) went to the hospital.

Analgesics (NSAIDS, paracetamol, dipyrone) and the antispasmodic-Hyoscine, were the most commonly used remedies by 187 (48.8%) and 42 (11.0%) respondents respectively. Less commonly used remedies were herbs in 3(0.8%), Antibiotics in 2 (0.5%) and the oral contraceptive pill (OCP) which was used specifically as a remedy for PMS (and not primarily for contraception) by only 1 respondent (0.3%) . One hundred and ninety four (50.7%) claimed subjective relief of symptoms after using these remedies

Table 5 tests the significance of association between severity of symptoms of respondents and their treatment seeking behaviour as well as remedy usage. Two hundred and twenty five (67.6%) of those with mild/moderate symptoms and twenty five (50.0%) of those with severe/extreme symptoms did not seek treatment. On the other hand, 50.0% (25) of those with severe/extreme symptoms and 32 %(108) of those with mild/moderate symptoms sought treatment. This difference was statistically significant (p = 0.023). Also, 48.3% (161) of those with mild/moderate symptoms did not use any form of remedy while only 22.0% (11) of those with severe / extreme symptoms failed to use any remedy. Thirty nine (78.0%) of those with severe/extreme symptoms used at least one form of remedy compared with 172 (51.7%) of those with mid/moderate symptoms who did same.

Table 6 tests the significance of association between the age of respondents, usage of oral contraceptive pills (OCP) and severity of their symptoms. Two hundred and twenty nine (68.8 %) respondents with mild/moderate symptoms were less than 25 years old, and so were 68.0% (34) of those with severe/extreme symptoms. Moreover, 32.0% (16) of those with severe/extreme symptoms were 25 years and above but this was also the case with 31.2% (104) of those with mild/moderate symptoms. There was no statistically significant difference between these two age groups (p=0.957). The study also showed that 11.4% (38) of those with

TABLE 5: SEVERITY OF SYMPTOMS IN RELATION TO TREATMENT SEEKING BEHAVIOUR AND REMEDY USAGE AMONG AFFECTED RESPONDENTS.

VARIABLE	SEVERITY OF SYMPTOMS		p-VALUE
	Mild/Moderate (N=333)	Severe/Extreme (N=50)	
TREATMENT			
Sought	108 (32.4%)	25 (50.0%)	
Not sought	225 (67.6%)	25 (50.0%	p= 0.023(S)
REMEDY			
Used	172 (51.7%)	39 (78.0%)	
Not used	161 (48.3%)	11 (22.0%)	p= 0.001(S)
(S) = Significant			

mild/moderate symptoms had been using oral contraceptive pills (primarily for contraception) but this also applied to 12.0% (6) of those with severe/extreme symptoms. Moreover, 88.0% (44) of those with severe / extreme symptoms were not using OCPs but this was also the case with 88.6 (295) of those with mild/moderate symptoms. There was no statistically significant difference between the two groups (p = 0.908).

Discussion
The study reveals a premenstrual syndrome (PMS) prevalence of 94.8% among female undergraduates of Ambrose Alli University, Ekpoma. This is comparable with the prevalence of 95.5% reported from Nairobi[21] and 99.6% reported from Ethiopia[22] but higher than the 85.5% prevalence reported by Antai et al [23] among female undergraduates of the University of Calabar. Prevalence rates up to 95% have been reported in many other studies[6, 7, 11, 34]. The high prevalence of PMS in this study population may be related to the high level of stress faced by University students. Their educational status also makes recall of symptoms easier in this group. Such factors have been highlighted in some studies[23, 32, 33].

Abdominal pain/discomfort, breast pain/swelling, fatigue, irritability and decreased interest in usual activities were the commonest symptoms of PMS and were all reported by over 40% of respondents. These symptoms have also been commonly reported in other studies[22, 23,24,35,36]. Oedema/weight gain, change in appetite and abdominal bloating were however not prominent symptoms in this study compared with some of these earlier reports. Suicide ideation was the least common symptom, affecting only 5.4% of respondents. It was also found to be a rare symptom in similar studies[22, 23].

Majority (86.9%) of the 383 respondents with PMS considered their symptoms as mild or moderate while only 50 (13.1%) reported their symptoms as severe or extreme. This prevalence figure of 13.1% for severe/extreme PMS is much higher than the often reported PMDD prevalence rate of 3-8%[2, 20]. It must be noted however that the latter figures are based on studies in the general population unlike this study conducted among University students who are at high risk of developing severe PMS possibly because of associated stress, as has been reported from other studies[23, 32, 33]. Moreover, an accurate diagnosis of PMDD using the DSM IV criteria requires prospective charting of symptoms, which was not the study design in this case.

Less than a quarter (17.5%) of the respondents with PMS considered it to be an illness and the majority (82.5%) perceived PMS as a normal part of womanhood. Rupani and Lema[22] reported similar findings among nurses in Nairobi. The general perception of PMS in this environment may influence the subjective reporting of severity of symptoms by affected respondents as well as their treatment-seeking-behaviour. Only about a third (34.7%) specifically sought treatment for this condition though more than half (55.1%) admitted using one form of remedy or the other for treating PMS. Majority of those who sought treatment consulted the patent medicine dispenser ("chemist") rather than going to the hospital. This is the general trend of consultations for ailments in our society where people are reluctant to go to the hospital due to financial constraints, and would rather opt for cheaper avenues of treatment or go on self-medication. Such practice however denies patients access to expert medical advice and optimal treatment.

Table 6: SEVERITY OF SYMPTOMS IN RELATION TO AGE OF AFFECTED RESPONDENTS AND ORAL CONTRACEPTIVE PILL USAGE.

VARIABLE	SEVERITY OF SYMPTOMS		p-VALUE
	Mild/Moderate (N=333)	Severe/Extreme (N=50)	
AGE			
<25	229 (68.8%)	34 (68.0%)	
=25	104 (31.2%)	16 (32.0%)	p= 0.957 (NS)
OCP			
Used	38 (11.4%)	6 (12.0%)	
Not used	295 (88.6%)	44 (88.0%)	p= 0.908 (NS)
(NS) = Not significant			

Analgesics, in particular the Non-steroidal anti-inflammatory drugs (NSAIDS) were the most commonly used form of remedy. This may be related to the fact that abdominal pain/discomfort and mastalgia were the most common symptoms in the study group. Moreover, NSAIDS and antispasmodics like hysoscine (Buscopan) are popular drugs for the treatment of dysmenorrhoea and that may also influence their choice as medications for PMS. Similar findings have been reported by Addis et al[23] and Singh et al[37].

Only 1 respondent (0.3%) used the oral contraceptive pill (OCP) specifically as a form of remedy for PMS and not primarily for contraception. This is probably because oral contraceptive use is generally perceived solely as a family planning method without other benefits. Notably too, non-pharmacological remedies like dietary modifications, aerobic exercise, stress management and cognitive behavioural therapy were not employed by any of the affected respondents. Moreover, serotoninergic antidepressants, now considered to be the first line treatment for emotional and affective premenstrual symptoms[1, 2,12,15,20], were not prescribed to, or used by any respondent. All these findings reflect the gross paucity of information on this subject, not only in the general population but even among health care providers as well.

The study shows a statistically significant relationship between severity of symptoms and treatment-seeking behaviour as well as remedy usage among affected respondents (P<0.05). Addis et al[23] reported similar results.
There was no significant difference in severity of symptoms between those less than 25 years old and respondents aged 25 and above (P>0.05).

Some other studies did not find any correlation between age and PMS either[22, 35]. Severe PMS/PMD is said to be more common in the late twenties and mid-thirties[1, 2, 20]. Such association was not obtained in this study probably because of the relatively few students aged 25 and above in the study population (124/404, 30.6%) with a mean age of 22.9 years. Variations in study population have been said to affect the assessment of such relationships.

There was also no significant relationship between oral contraceptive use and severity of symptoms (P>0.05). Addis et al [23] reported similar findings. The very low level of OCP utilization as contraceptive in the study group (48/404, 11.9%) may have affected this result. Moreover, while oral contraceptives have benefit in the treatment of dysmenorrhoea, their efficacy in the treatment of PMS is yet to be substantiated, with some women even reporting exacerbation of symptoms with OCP usage[1, 2, 20, 29]. Conclusion: PMS was found to be a very common condition in this study with a prevalence of 94.8%, yet is a seldom discussed topic, even among medical experts in this country. This no doubt contributes to the paucity of information on the subject among the general populace as well as the obvious knowledge deficit in the management of this condition. More prevalence studies on PMS especially using prospective methods are recommended. Public enlightenment programmes on this condition is also advocated in order to bridge the information gap on the subject matter in our society. This will lead to a better understanding of a condition which may significantly impair the quality of life of women in the reproductive age group and also has potential medico-legal implications.

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