

Original contribution

Premenstrual dysphoric disorder amongst Nigerian university students: prevalence, comorbid conditions, and correlates

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Summary

Aims: The rate of premenstrual dysphoric disorder (PMDD) amongst sub-Saharan Africans is unknown. This study aimed to estimate the rate of PMDD amongst Nigerian undergraduates and to evaluate psychosocial correlates and comorbid psychiatric conditions.

Method: Female university students ($n = 410$) completed questionnaires detailing sociodemographic, menstruation, and gynaecological history. They also completed the Big Five Personality Inventory (BFI), and the presence of PMDD and any other DSM-IV axis 1 psychiatric diagnosis was assessed with the Mini International Neuropsychiatric Interview (MINI).

Results: The prevalence of PMDD was 6.1% and the correlates included older age ($p = 0.001$), painful menstruation ($p = 0.006$), and high score on neuroticism scale ($p = 0.019$). Compared with participants without PMDD, participants with PMDD have significantly higher rates for the following psychiatric diagnoses: dysthymia (odds ratio [OR], 3.82; 95% confidence interval [CI], 1.68–8.69), major depressive disorder (OR, 17.00; 95% CI, 6.72–43.00), panic disorder (OR, 4.39; 95% CI, 1.35–14.30), and generalised anxiety disorder (OR, 1.21; 95% CI, 1.21–17.83).

Conclusion: The rate of PMDD in sub-Saharan African women was comparable to that in the western cultures. Planning and implementing an effective strategy to manage perimenstrual problems in this region should be an issue of priority.

Keywords: Premenstrual dysphoric disorder; cross cultural; prevalence; correlates

Introduction

Premenstrual dysphoric disorder (PMDD) constitutes the most severe spectrum of premenstrual symptoms.

According to the DSM-IV (American Psychiatric Association 1994), the diagnosis requires a woman to have at least 5 out of 11 mood and physical symptoms. One of the five symptoms must be a mood symptom, which includes depressed mood, anxiety, mood lability, or irritability. Other symptoms include fatigue, sleep changes, appetite changes, decreased interest, difficulty concentrating, feeling overwhelmed or out of control, and physical symptoms such as breast tenderness, bloating, or headaches. Symptoms must be confined to the luteal phase of the cycle and be severe enough to cause psychosocial impairment. The DSM-IV also states that the symptoms must not merely be an exacerbation of another disorder. Studies have shown that women with PMDD report impaired social adjustment, poorer subjective quality of life, and increased interpersonal impairment more than women without PMDD (Hellman and Georgiev 1987; Campbell et al. 1997; Hylan et al. 1999; Kuan et al. 2002; Halbreich et al. 2003).

Epidemiological studies from western cultures have yielded rates of 3–9% (Pearlstein and Stone 1998, Halbreich et al. 2003). However, research findings have suggested that differences in premenstrual symptomatology are related to sociocultural factors (Woods et al. 1982; Huerta-Franco and Malacara 1993; Van Den Akker et al. 1995), and it is not known if such prevalence rates are obtainable in non-western cultures like sub-Saharan Africa. Moreover, of the 11 PMDD criteria defined by the DSM-IV (American Psychiatric

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Association 1994), 10 are either emotional or behavioural with only one criterion relating to common physical symptoms. This could mean that women with predominantly physical symptoms (including many sub-Saharan Africans, who are known to somatise their emotional symptoms [Goldberg and Bridge 1998]) would not meet diagnostic criteria.

PMDD can be superimposed upon another psychiatric disorder and comorbidity has been documented (Anderson et al. 1988; Fava et al. 1992; Angst et al. 2001; Wittchen et al. 2002). However, most of the studies reporting a high comorbidity have been clinic based rather than community studies (Landen and Eriksson 2003). Biological factors have been well related to the aetiology of PMDD, and although there is evidence to suggest negative attributions and personality factors (Fontana and Palfai 1994; Blake 1995; Fontaine and Seal 1997), the literature investigating the role of psychological factors in PMDD is scarce. There are few studies documenting menstrual and premenstrual experience of women in sub-Saharan Africa including Nigeria (Fakeye and Adegoke 1994; McMaster et al. 1997; Moronkola and Uzuegbu 2006), but none have directly measured PMDD retrospectively. In summary, the rate of PMDD amongst sub-Saharan Africans is unknown, community-based studies on comorbidity are scarce, and the influence of psychosocial factors in PMDD has been largely ignored.

This study aimed to estimate the rate of PMDD amongst Nigerian undergraduates. We also aimed to evaluate comorbid psychiatric conditions and other psychosocial correlates.

Methods

Participants

The participants were female students of the Obafemi Awolowo University, Ile-Ife, a federal university in south-western Nigeria with about 30,000 students from the three main tribes in Nigeria (Yoruba, Hausa, and Igbo), and the two major religions in the country (Christianity and Islam). The students were approached through their halls of residence. A multistage sampling technique was adopted. The 5 female halls of residence located inside the campus consist of 456 rooms. Each room is inhabited by an average of 5–6 students. Each even numbered room was then selected ($n = 228$). Two students were then randomly selected by balloting from each of the even numbered rooms (making a total student number of 456). This method produced a sample with approximately equal probability of selection of each member. Out of the 456 students selected, 32 refused participation, so a total number of 424 female students were interviewed.

Procedure

The Ethics and Research Committee of the Obafemi Awolowo University Teaching approved the study protocol, informed consents were obtained from the participants after the aims and objectives of the study had been explained. The students then completed a questionnaire detailing sociodemographic variables, menstruation variables, and gynaecological variables and the Big Five Personality Inventory (BFI) (John et al. 1991). Two trained clinicians and a psychiatrist then interviewed the participants for the presence of PMDD and the current episodes of other axis 1 disorders with the Mini International Neuropsychiatric Interview (MINI) (Sheehan et al. 1998). To distinguish between cases of PMDD and premenstrual magnification, the diagnostic interviews specifically asked questions that ascertain whether women with PMDD were truly asymptomatic after menses. There was emphasis on the DSM-IV criteria of symptoms presence for most of the time during the last week of the luteal phase, began to remit within a few days after the onset of the follicular phase, and were absent in the week post menses.

Measures

The Big Five Personality Inventory (BFI) (John et al. 1991) is a 44-item self-completed questionnaire in which participants are required to rate their level of agreement or disagreement with the characteristics as they apply to them. The answers are graded from 1 (disagree strongly) to 5 (agree strongly). The 44 items measure 5 traits (8 items for extraversion, 9 items for agreeableness, 9 items for conscientiousness, 8 items for neuroticism, 10 items for openness). Mean scores are generated for each of the traits.

The Mini International Neuropsychiatric Interview (MINI) (Sheehan et al. 1998) was designed as a brief structured interview for the major axis I psychiatric disorders in DSM-IV. Validation and reliability studies have been done for MINI and showed that it has acceptably high validation and reliability scores. Clinicians can use it after a brief training session, but lay interviewers require training that is more extensive. The interviews were conducted in English, which is the official and most common form of communication in Nigeria, a multilingual country with over 200 languages and dialects. Since the MINI is structured in simple lay language that is easy to understand and the participants were students in tertiary institutions, no problem was encountered in administering the instrument. The mean interrater agreement between the three interviewers based on 20 participants was 0.89 measured by Cohen's Kappa.

Data analysis

The Statistical Package for the Social Sciences 11 (SPSS.11) program was used for statistical analysis. Participants were classified as cases or noncases of PMDD on the basis of the DSM-IV criteria as contained in the MINI. Results were calculated as frequencies, means, and standard deviations (SD). Group comparison was chi-square test, *t*-test, and odds ratio (95% confidence interval [CI]). Significant variables were entered into a logistic regression analysis to determine the predicting variables. All tests were 2-tailed, and the level of significance was set at $p < 0.05$.

Table 1. Association of menstrual and personality variables with the diagnosis of PMDD

Variable	Mean (SD) for group with:		<i>t</i>	df	<i>p</i>
	PMDD (<i>n</i> = 25)	No PMDD (<i>n</i> = 385)			
Age (years)	24.32 (1.84)	21.99 (2.93)	3.913	408	<0.001
Age at menarche (years)	13.72 (1.48)	13.38 (1.68)	0.973	408	0.331
Length of flow (days)	4.74 (0.44)	4.32 (0.80)	2.523	408	0.012
Length of cycle (days)	27.76 (2.52)	227.07 (2.97)	1.128	408	0.260
BMI (kg)	21.15 (2.42)	21.69 (3.01)	0.872	408	0.384
BFI scales					
Extraversion	22.72 (6.55)	23.59 (6.39)	-0.662	408	0.508
Agreeableness	37.44 (6.61)	35.82 (5.38)	1.434	408	0.152
Conscientiousness	36.76 (4.26)	35.39 (6.43)	1.052	408	0.203
Neuroticism	24.24 (7.67)	20.42 (5.24)	3.407	408	0.001
Openness	34.44 (7.05)	35.81 (6.51)	-1.013	408	0.312

Results

Menstrual and personality details

Out of the 424 students that participated in the study, 14 had incomplete data, so the final analysis was based on 410. The mean age of the participants was 22.13 (SD, 2.93) years. The average age at menarche was 13.40 (SD, 1.67) years. The mean length of menstrual flow was 4.35 (SD, 0.79) days and the average length of cycle was 27.12 (SD, 2.95) days. The mean body mass index was 21.66 (SD, 2.99) kg. Of the 410 participants, 369 (90.0%) had regular menstrual flow, 7 (1.7%) presently use contraceptives, 13 (3.2%) had used contraceptives in the past, while 7 (1.7%) had been pregnant in the past. While 18 (4.4%) drink alcohol, only 2 (0.5%) smoke cigarettes. A total of 63 students (15.4%) claimed they never had pain premenstrually, while 233 (56.8%) claimed they sometimes have pain and 114 (27.8%) claimed they always have pain premenstrually. While 115 (28.0%) had mild premenstrual pain, premenstrual pain was moderate for 167 (40.7%) and severe for 50 (12.2%) students. Out of the 410 students interviewed, 127 (31.0%) were at the last week of the luteal phase or currently having their menses.

The mean scores on the BFI scales were 23.54 (SD, 6.40) for extraversion, 35.92 (SD, 5.47) for agreeableness, 35.47 (SD, 6.32) for conscientiousness, 20.66 (SD, 5.49) for neuroticism, and 35.72 (SD, 6.54) for openness.

Prevalence and correlates of PMDD

A total of 25 (6.1%) met the DSM-IV provisional diagnosis of PMDD. There was no significant difference in the rate of provisional PMDD between the participants in their perimenstrual period (8 of 127) and those not in the perimenstrual period (17 of 283). When the menstrual and

personality variables were correlated with the diagnosis of PMDD, analysis (Tables 1 and 2) showed that the variables significantly associated with PMDD were age ($p < 0.001$), length of menstrual flow ($p = 0.012$), presence of pain ($p < 0.001$), severity of the pain ($p < 0.001$), and scores on the neuroticism scale of the BFI ($p = 0.001$). We did not analyse the use of contraceptives (present or past), drinking, or smoking because the values were too small for any meaningful analysis. When the indicated variables were then entered into a logistic regression analysis, length of menstrual flow and severity of the pain dropped out of the analysis leaving age, presence of pain, and neuroticism as the predicting variables (Table 3).

Comorbid psychiatric conditions

Using the MINI, the common psychiatric diagnosis in the participants include dysthymia for 17 (4.1%), major depressive disorder 20 (4.9%), panic disorder for 26

Table 2. Association of menstrual characteristics with the diagnosis of PMDD

Characteristic	Nr. (%) of participants with:		χ^2	df	<i>p</i>
	PMDD (<i>n</i> = 25)	No PMDD (<i>n</i> = 385)			
Regularity of cycle					
Regular	23 (4.9)	346	0.118	1	0.731
Irregular	2 (6.2)	39			
Pain during flow					
Not at all	4 (6.3)	59	18.906	2	<0.001
Sometimes	5 (2.1)	228			
All the times	16 (14.0)	98			
Severity of pain (<i>n</i> = 332)					
Mild	3 (2.6)	112	18.291	2	<0.001
Moderate	6 (3.6)	161			
Severe	9 (18.0)	41			

Table 3. Logistic regression analysis of the variables significantly associated with the diagnosis of PMDD

Variables	B	SE	Wald	df	<i>p</i>	Exp (B)	95% CI for Exp (B)
Age in years	0.340	0.101	11.220	1	0.001	1.405	1.151–1.714
Pain during flow	1.568	0.574	7.454	1	0.006	4.798	1.556–14.790
Neuroticism	0.107	0.046	5.461	1	0.019	1.113	1.017–1.218

Table 4. Rates of common psychiatric disorders for participants with and without PMDD

Comorbid diagnosis	Nr. (%) of participants in:			Odds ratio (95% CI) ^a
	Total (<i>n</i> = 410)	Group with PMDD (<i>n</i> = 25)	Group without PMDD (<i>n</i> = 385)	
Dysthymia	17 (4.1)	3 (12.0)	14 (3.6)	3.61 (0.99–13.21)
Major depressive disorder	20 (4.9)	6 (24.0)	14 (3.6)	8.37 (2.94–28.80)*
Panic disorder	26 (6.3)	5 (20.0)	21 (5.5)	4.33 (1.51–12.46)*
Bipolar disorder	8 (2.0)	3 (12.0)	5 (1.3)	10.36 (2.37–45.26)*
Social phobia	19 (4.6)	4 (16.0)	15 (3.9)	4.70 (1.46–15.10)*
Obsessive-compulsive disorder	11 (2.7)	3 (12.0)	8 (2.1)	6.43 (1.63–25.37)*
Generalised anxiety disorder	16 (3.9)	4 (16.0)	12 (3.1)	3.14 (0.99–9.95)

^a Asterisk indicates values for significant variable.

(6.3%), bipolar affective disorder for 8 (2.0%), social phobia for 19 (4.6%), obsessive compulsive disorder for 11 (2.7%), and generalised anxiety disorder for 16 (3.9%) participants. Table 4 shows the analysis of participants with PMDD having these disorders compared to participants without PMDD having the disorders. From Table 4, the most frequent comorbid condition is depression with 24.0% in PMDD participants compared with 3.6% in participants without PMDD (odds ratio, 8.37; 95% CI, 2.94–28.80).

Discussion

To our knowledge, our study was the first to retrospectively assess PMDD in sub-Saharan Africa young women. We found a prevalence of 6.1% in our study and this is comparable to the rates of 3–9% found in Europe and the United States (Pearlstein and Stone 1998, Halbreich et al. 2003). This suggests that PMDD is a cross-cultural phenomenon. We are aware that our study did not use the daily ratings to confirm our diagnosis and that rates depend on which symptoms are assessed and how symptom change is measured (Hurt et al. 1992). Our PMDD diagnosis has value as the requirement for prospective daily ratings of symptoms for at least 2 consecutive cycles has been criticised as an extremely stringent and restrictive diagnostic requirement for any mental disorder and being almost impossible to achieve either in clinical practise or large-scale

studies (Warner and Bancroft 1990; Eriksson et al. 2002; Landen and Eriksson 2003).

We found older age, presence of pain, and high scores on the neuroticism scale as the independent correlates of PMDD in our study. Our participants are mainly young adults and the age difference may not really be a significant issue. Dysmenorrhoea can sometimes be a disabling symptom and the presence of pain may cause distress and aggravate the emotional and behavioural response to such menstrual symptomatology, increasing the likelihood of PMDD. Likewise the direction may be the other way, PMDD may make the subject perceive premenstrual symptoms as painful or aggravate the pain associated with menstruation. Personality factors have been associated with premenstrual symptomatology for a long time (Coppin and Kessel 1963; Freeman et al. 1995) and this view is further supported by our study. We found participants scoring high on the neuroticism scale to be significantly more likely to have PMDD. Previous researches have suggested that negative attributions may have a role to play in PMDD (Fontana and Palfai 1994; Blake 1995; Fontaine and Seal 1997).

We found that a high proportion of our women with PMDD also have other current axis 1 psychiatric disorders and the rates were higher compared to those for women without PMDD. Our rates were however lower than those reported in most studies in western cultures. However, most of these studies reporting a high comorbidity were based on patients seeking help at premen-

strual symptom clinics, rather than on a population-based sample (Landen and Eriksson 2003). Our comorbidity rates are comparable to recent community studies (Angst et al. 2001; Wittchen et al. 2002).

Our study found a rate for depression of 24.0% for the women with PMDD. This is much lower than the rate of 49% found by Angst et al. (2001) but much higher than that of 11.8% found by Wittchen et al. (2002). PMDD and depression may have many interactions. Both have been linked to serotonin (5-HT) dysfunction (Menkes et al. 1994; Steiner and Pearlstein 2000). We also found a significant increase in the rates of most specific anxiety disorders and bipolar disorder for women with PMDD compared with those without PMDD. Anxiety and PMDD may be physiologically linked. Differences in gamma-aminobutyric acid (GABA) plasma levels in women with PMDD have been found and serial proton magnetic resonance spectroscopic measurements showed decreased cortical GABA levels during the follicular phase in women with PMDD compared with controls (Epperson et al. 2002).

There are some limitations to our study. We had not used the recommended daily prospective ratings so our diagnosis of PMDD was “provisional”. The study was done in a single centre and our sample is small and limited to a small age range. Our study is also cross sectional, so caution must be taken in inferring causality. A prospective large-scaled and multicenter study should be carried out in the future to further validate our findings. The strength of our study is in its coming from a culture not studied before and the use of a diagnostic instrument for axis I disorders.

In conclusion, we have shown that the rate of PMDD assessed once during an interview in young, educated (and presumably more affluent) sub-Saharan African women was comparable to that in western cultures. The correlates included dysmenorrhoea and high scores on the neuroticism scales. There was moderately high comorbidity with depression and anxiety disorders. All these should be taken into consideration when planning and implementing an effective strategy to manage perimenstrual problems in this region.

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