Prevalence, Severity, and Correlates of Premenstrual Dysphoric Disorder Symptoms Among Women in the Arabian Peninsula

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ABSTRACT

Objective: To study the prevalence of premenstrual dysphoric disorder (PMDD) symptom patterns among women in the United Arab Emirates and to measure the debilitating nature of PMDD symptoms and sociodemographic correlates.

Methods: This cross-sectional sample study used the Mini-International Neuropsychiatric Interview–Plus (MINI-Plus) and Premenstrual Symptoms Screening Tool (PSST) to screen for presence and severity of PMDD symptoms in Arab women attending ambulatory health services in Alain city, Emirate of Abu Dhabi, United Arab Emirates, for routine health care between May 2005 and September 2005.

Results: The study participants include 508 women (76% Emiratis, 15% Omanis, and 8% other Arabs) of childbearing age. In total, 94 women (18.6%) met MINI-Plus criteria for PMDD; of these, 21 (4.1%) met PSST criteria for severe symptoms, 29 (5.7%) for moderate symptoms, and 44 (8.7%) for mild or less symptoms. One woman (0.2%) with severe symptoms and 12 women (2.4%) with moderate symptoms had negative MINI-Plus scores. Presence of PMDD symptoms was significantly associated with higher education ($P = .000$), single marital status ($P = .001$), major life stressors ($P = .001$), and personal/family use of psychotropic medications ($P = .000$/$P = .006$), personal/family psychological problems ($P = .000$/$P = .001$), irregular/painful menses ($P = .043$/$P = .001$), and functional impairment on the Sheehan Disability Scale ($P = .000$). Multilogistic regression analysis showed higher education, major life stressor, personal use of psychotropic medications, personal/family psychological problem, and painful menses were independent predictors of PMDD symptoms.

Conclusions: PMDD symptoms were common among the Arab women in our study. The cyclically triggered mood disturbances were clustered in women with personal/familial psychological problems, perhaps linking biologic constitution to genetic predisposition for the development of PMDD symptomatology.

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Many women of reproductive age (15–49 years) experience premenstrual symptoms of varying severity. Premenstrual dysphoric disorder (PMDD), however, describes the severe cyclical mood disorder and psychosocial impairment that precede menses.[1] The symptoms occur with most menses and are mainly limited to the luteal phases of ovulatory cycles.[2,3] At least 2%–8% of women meet the strict criteria of the disorder[4] as defined in the *DSM-IV* and *DSM-5*, a prevalence that is higher than many *DSM* Axis I disorders.[1]

Pathogenicity of PMDD has been recently illustrated. Allopregnanolone (a main derivative of progesterone) is known to affect mood and mood disorders via the action of γ-aminobutyric acid.[5] This neuroactive steroid peaks in the luteal phase and declines sharply after the onset of menses; this cyclicity contributes to the etiology of PMDD.[5–7] Another reported predisposing factor is the polymorphism methionine allele (G196A) in the brain-derived neurotrophic factor gene, which conveys lower frontocingulate cortex activation during the luteal phase.[8] Other potential variables include increased gray matter volume in the posterior cerebellum, increased inflammatory biomarkers, and exposure to significant emotional or physical trauma.[8–13]

With respect to therapy, serotonergic antidepressants are considered the drugs of choice. The reported rapid response to luteal or continuous dosing of selective serotonin reuptake inhibitors suggests the mechanism of PMDD differs from that of major depressive disorder.[14,15] This hasty therapeutic gain may reflect a reversal of the underlying mechanism of PMDD or simply an alleviation of its symptomatology.[16] Other useful interventions include cognitive-behavioral therapy, skills training, and nutritional recommendations.[17]

Prevalence and severity of PMDD symptoms in Arab women have not been previously investigated. This community-based study combined 2 instruments to screen for the presence and severity of the disorder symptoms in women in the region.

METHODS

Women presenting in 5 ambulatory health services in Alain city (Emirate of Abu Dhabi, United Arab Emirates) for routine health care between May 2005 and September 2005 were recruited for this cross-sectional sample study. The study was approved by the Alain Medical District Human Research Ethics Committee Review Board. Informed consent was obtained from each participant.

The study used validated Arabic versions of the Mini-International Neuropsychiatric Interview–Plus

Clinical Points

- Premenstrual dysphoric disorder (PMDD) is relatively common among Arabic women.
- PMDD symptoms are mainly clustered in women with personal or familial psychological problems and correlate with functional impairments on the Sheehan Disability Scale.
- Higher education, major life stressors, personal use of psychotropic medications, personal/family psychological problems, and painful menses are independent predictors of PMDD symptoms.

(MINI-Plus),[18,19] Premenstrual Symptoms Screening Tool (PSST),[20] and Sheehan Disability Scale (SDS).[21] The surveys were completed by participating women in the presence of trained female staff who were fluent in the Arabic language and well equated to the Arabian culture. Participation was voluntary, and the questionnaire answers were anonymous and confidential.

The MINI-Plus and PSST were used as screening instruments for the presence and severity of PMDD symptomatology.[1] The PSST is a 1-page test that transforms categorical *DSM-IV* criteria into a rating scale with degrees of severity.[20] The PSST scores 14 symptoms that start before onset of bleeding and resolve within a few days of bleeding on a 4-point rating scale (not at all [0], mild [1], moderate [2], or severe [3]); the maximum score was 42.

Perceived functional disability was evaluated on the 4 SDS responsibility domains: work/school, social life, family/home, and religious duties.[21] This 10-point/domain Visual Analog Scale measured self-reported impairments. The domains were analyzed separately and summed into a single functional impairment score that ranged from zero (unimpaired) to 40 (highly impaired). A score ≥ 5 on any domain or a sum score of 20 necessitated monitoring.[21]

Statistical Analysis

Simple and multiple logistic regression analyses were performed using the statistical package IBM SPSS (version 20) to investigate the association of several variables with PMDD symptoms. A significance level (α) < .05 was used.

RESULTS

The study included 508 women; their characteristics are shown in Table 1. Thirty-seven percent of the participants had a college degree, 78% had reasonable income, 54% had excess body fat, 85% reported work-related problems, and 60% had illness in the family. Medical problems (≤ 17%) and functional disabilities (≤ 11%, as screened by SDS) were infrequent, while psychological problems (32%), irregular (onset of menses varied > 7 days each month) menstrual cycles (28%), and low back/pelvic pain during menses (73%) were relatively common (Table 1).

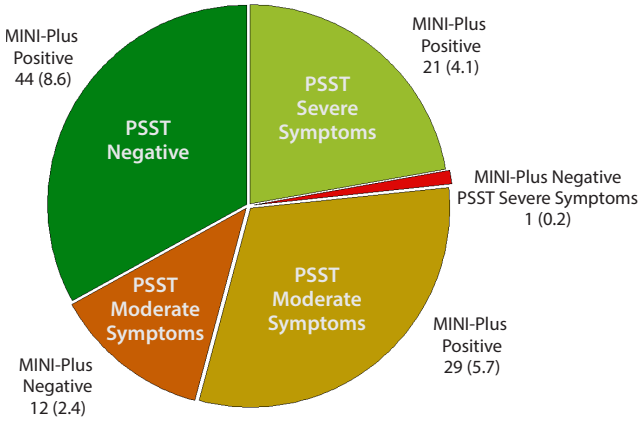
Ninety-four women (18.6%) met MINI-Plus criteria for positive PMDD symptomatology. Of these, 21 met PSST criteria for severe symptoms (4.1%), 29 for moderate

Table 1. Sample Characteristics (N = 508)

Age, mean ± SD (median), range, y	29 ± 8 (28), 18–50
BMI (kg/m^2), mean ± SD (median), range	26.2 ± 5.6 (25.4), 14.1–50.6
World Health Organization BMI categories	
Thinness (< 18.5 kg/m^2)	24 (5)
Normal (18.5 to < 25 kg/m^2)	204 (41)
Overweight (25 to < 30 kg/m^2)	163 (32)
Obese (≥ 30 kg/m^2)	113 (22)
Nationality, n (%)	
United Arab Emirates citizens	388 (76)
Omani citizens	74 (15)
Other Arabs	43 (8)
Not specified	3 (1)
Education, n (%)	
College	189 (37)
High school	152 (30)
Middle school	59 (12)
Elementary school	39 (8)
None	69 (14)
Monthly income, n (%)	
> $4,000	47 (9)
$2,700–$4000	83 (17)
$1,400–$2,700	261 (52)
< $1,400	113 (22)
Marital status, n (%)	
Single	169 (33)
Married	301 (59)
Separated	2 (< 1)
Widow	19 (4)
Divorced	17 (4)
Polygamy, n (%)	
No	252 (81)
Yes	61 (19)
Adverse life events in past 12 mo, n (%)	
Health problem	92 (18)
Financial problem	93 (18)
Family conflict	85 (17)
Children-related difficulty	74 (15)
Separation or divorce	28 (6)
Car accident	46 (9)
Death in the family	99 (19)
Illness in an immediate family member	175 (34)
Illness in other relatives	131 (26)
Personal illness, n (%)	
Diabetes	31 (6)
Hypertension	28 (6)
Cardiovascular disease	3 (< 1)
Asthma	45 (9)
Arthritis	45 (9)
Hearing or vision impairment	87 (17)
Other variables, n (%)	
Smoking	6 (1)
Personal use of psychotropics	83 (16)
Family member using psychotropics	28 (6)
Personal psychological problem	162 (32)
Family member with psychological problem	30 (6)
Family member using alcohol or narcotics	14 (3)
Onset of menses varied > 7 days each month	144 (28)
Low back/pelvic pain during menses	371 (73)
SDS, n (%)	
Work/school score ≥ 5	26 (5)
Social life score ≥ 5	44 (9)
Family/home score ≥ 5	55 (11)
Religious duties score ≥ 5	26 (5)
Sum score ≥ 20	17 (3)
MINI-PLUS, n (%)	
Positive	94 (18.6)
Negative	412 (81.4)
PSST, n (%)	
Severe symptoms	22 (4.3)
Moderate symptoms	41 (8.1)
Mild or less symptoms	445 (87.6)

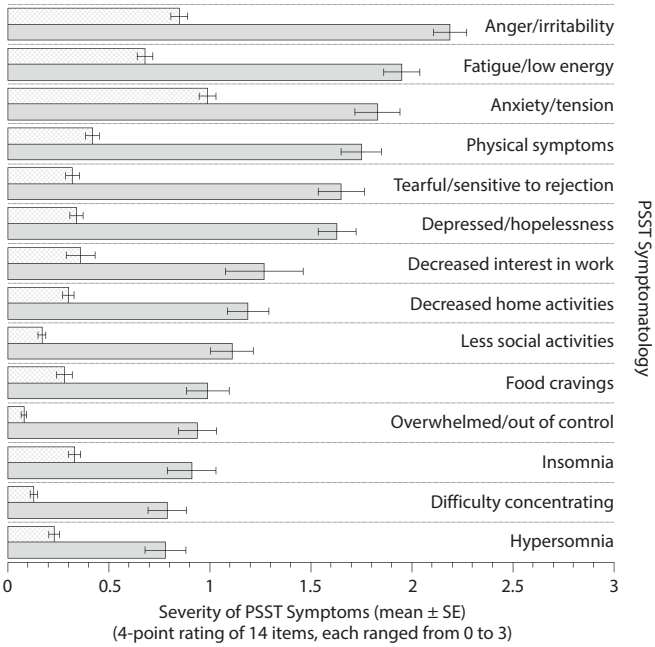
Abbreviations: BMI = body mass index, MINI = Mini-International Neuropsychiatric Interview, PSST = Premenstrual Symptoms Screening Tool, SDS = Sheehan Disability Scale (scores ranged from zero [unimpaired] to 40 [highly impaired]; a score ≥ 5 on a domain or a sum score of 20 necessitates monitoring).

Figure 1. Number (%) of Symptomatic Women as Screened by MINI-Plus and PSST



Abbreviations: MINI = Mini-International Neuropsychiatric Interview, PSST = Premenstrual Symptoms Screening Tool.

Figure 2. Severity of PSST Symptoms in MINI-Plus Positive (n = 94, plain bars) and MINI-Plus Negative (n = 412, crossed bars) Women



Abbreviations: MINI = Mini-International Neuropsychiatric Interview, PSST = Premenstrual Symptoms Screening Tool.

Table 2. Simple Logistic Regression of MINI-Plus Positive Symptoms Versus Selected Predictors[a]

Variable	Coefficient	*P*	Odds Ratio	95% CI for OR
Age, y	−0.04	.006	0.96	0.93–0.99
Education				
Elementary school/ untaught	−0.1.90	.000	0.15	0.07–0.34
High school/middle school	−0.11	.000	0.33	0.20–0.54
College (reference)	…	…	…	…
Marital status				
Single	0.81	.001	2.25	1.42–3.58
Married (reference)	…	…	…	…
Major adverse life events in past 12 months				
Yes	1.12	.001	3.06	1.57–5.93
No (reference)	…	…	…	…
Personal use of psychotropics				
Yes	1.35	.000	3.86	2.31–6.47
No (reference)	…	…	…	…
Personal psychological problem				
Yes	0.99	.000	2.68	1.70–4.23
No (reference)	…	…	…	…
Family use of psychotropics				
Yes	1.11	.006	3.04	1.38–6.73
No (reference)	…	…	…	…
Family member with psychological problem				
Yes	1.31	.001	3.69	1.73–7.90
No (reference)	…	…	…	…
Onset of menses varied >7 days each month				
Irregular	0.49	.043	1.63	1.02–2.61
Regular (reference)	…	…	…	…
Low back/pelvic pain during menses				
Yes	1.10	.001	3.00	1.58–5.70
No (reference)	…	…	…	…
SDS work/school domain				
Score ≥ 5	2.48	.000	11.95	4.39–32.52
Score < 5 (reference)	…	…	…	…
SDS social life score domain				
Score ≥ 5	3.45	.000	31.35	13.89–70.74
Score < 5 (reference)	…	…	…	…
SDS family/home domain				
Score ≥ 5	2.65	.000	14.21	7.58–26.63
Score < 5 (reference)	…	…	…	…
SDS religious duties domain				
Score ≥ 5	3.44	.000	31.17	10.43–93.11
Score < 5 (reference)	…	…	…	…

[a]Age, BMI, monthly income, and personal illness were insignificant predictors of positive MINI-Plus.
Abbreviations: BMI = body mass index, MINI = Mini-International Neuropsychiatric Interview, SDS = Sheehan Disability Scale.

symptoms (5.7%), and 44 for mild or less symptoms (8.7%). One woman with severe symptoms (0.2%) and 12 women with moderate symptoms (2.4%) had negative MINI-Plus scores.

One of the 22 women with severe symptoms (4.5%) and 12 of the 41 women with moderate symptoms (29.3%) (as screened by PSST) had negative MINI-Plus scores. Forty-four of the 94 women with positive MINI-Plus scores (46.8%), on the other hand, had negative PSST scores. Using both instruments, 107 of the 508 women (21.1%) had PMDD symptoms (22 had severe symptoms by PSST, 41 had moderate symptoms by PSST, and 44 had positive MINI-Plus scores only).

Figures 1 and 2 compare the severity of PSST symptoms in MINI-positive (n = 94) and MINI-negative (n = 412) women. Women who screened positive by MINI-Plus had more severe symptomatology for the entire 14 items of the PSST, suggesting all of these symptoms are relevant to PMDD. Anger/irritability (mean ± SE score: 2.19 ± 0.08, maximum score per item: 3.0), fatigue/low energy (score: 1.95 ± 0.09), anxiety/tension (score: 1.83 ± 0.11), somatic

Table 3. Multilogistic Regression of MINI-Plus Positive Symptoms Versus Selected Predictors[a]

Variable	Coefficient	*P*	Odds Ratio	95% CI for OR
Education				
Elementary school/untaught	−1.99	.000	0.14	0.05–0.35
High school/middle school	−1.34	.000	0.26	0.15–0.47
College (reference)	…	…	…	…
Major adverse life events in past 12 months				
Yes	0.92	.013	2.51	1.21–5.18
No (reference)	…	…	…	…
Personal use of psychotropics				
Yes	1.30	.000	3.66	1.97–6.82
No (reference)	…	…	…	…
Personal psychological problem				
Yes	0.68	.013	1.98	1.16–3.38
No (reference)	…	…	…	…
Family member with psychological problem				
Yes	1.26	.008	3.52	1.39–8.91
No (reference)	…	…	…	…
Low back/pelvic pain during menses				
Yes	0.99	.008	2.70	1.29–5.65
No (reference)	…	…	…	…

[a]The model included all significant variables in Table 2.
Abbreviation: MINI = Mini-International Neuropsychiatric Interview.

Table 4. Multilogistic Regression of Severe Symptoms as Screened by PSST Versus Selected Predictors[a]

Variable	Coefficient	*P*	Odds Ratio	95% CI for OR
Personal use of psychotropics				
Yes	2.02	.000	7.52	2.89–19.56
No (reference)	…	…	…	…
Family member with psychological problem				
Yes	1.37	.041	3.93	1.06–14.59
No (reference)	…	…	…	…
Marital status				
Single	0.98	.046	2.67	1.02–7.0
Married (reference)	…			

[a]The model included all significant variables in Table 2.
Abbreviation: PSST = Premenstrual Symptoms Screening Tool.

symptoms (score: 1.75 ± 0.10), and tearful/sensitivity to rejection (score: 1.65 ± 0.12) were particularly dominant complaints.

Simple logistic regression model showed the presence of PMDD symptoms (as screened by MINI-Plus) was associated with higher education, single marital status, major life stressors, personal or family use of psychotropic medications, personal or family psychological problem, irregular or painful menses, and SDS functional disability ($P \leq .006$, Table 2). Multilogistic regression showed higher education, major life stressor, personal use of psychotropic medications, personal or family psychological problem, and painful menses were independent predictors of PMDD symptoms as screened by the MINI-Plus ($P \leq .013$, Table 3). Similarly, personal use of psychotropic medications, family member with psychological problem, and single marital status were independent predictors of severe PMDD symptoms as screened by the PSST ($P \leq .046$, Table 4).

DISCUSSION

PMDD symptomatology is founded on the presence of premenstrual affective disorder (severe depressed mood and anxiety) associated with cognitive impairment (difficulty concentrating), increased interpersonal conflicts, and somatic complaints.[1–3] Diagnosis is confirmed by prospective daily rating of 2 or more consecutive symptomatic cycles, which represents a limitation in our study.[22–24] Our study instead used 2 scales as screening instruments to estimate prevalence and severity of PMDD symptoms in Arab women. The results show that 18.6% of women had PMDD symptoms and 4.3% had severe symptoms. These values are comparable to previously reported prevalence in other populations (about 8%).[4]

The PSST appeared to apply necessary measures for assessing severity and impact of the symptoms on quality of life. The test was quick and practical.[20] Although PMDD is classified in the *DSM-IV* as a mood disorder (depression not otherwise specified), anxiety was equally representative. As previously reported, psychological symptoms were more prominent than somatic complaints.[22–24] Thus, unlike other culturally sensitive psychiatric syndromes, our culture had inconsequential influences on the PMDD symptoms.

Presence of PMDD symptoms was more frequent in educated, single women with life stressors and personal or family history of psychological problem. These findings suggest both acquired and inherited predispositions contribute to the development of symptoms. PMDD symptoms should be recognized by physicians who are involved with women's health.[23] Prompt referral of symptomatic women is essential, as intervention is often necessary.[24]

Although we used *DSM-IV* criteria for the disorder, both *DSM-IV* and *DSM-5* diagnoses required the premenstrual pattern to include at least 5 physical, affective, or behavioral symptoms, with a requirement of specific qualities for the key affective symptoms, which are all satisfied in our study.[2] The extended form of the MINI-Plus has a full module for PMDD with questions designed to inquire about these criteria. We have used this extended MINI-Plus module in our study. In complement, we also used another scale (SDS) to measure the severity of the impairment in functioning in the domains listed in the *DSM-5* criteria (work/school, social/interpersonal, and family responsibilities).

Studies involving the natural history and long-term outcome of PMDD in different societies are needed. This information helps to illustrate the complex interactions between the rapidly evolving predisposing factors (genetic, biological, and psychological variables) and the sociocultural contributors to the disease. National campaigns (written and media) aiming to improve public awareness of PMDD symptoms are also needed.[22] Future research should explore genes (eg, using whole exome sequencing) that could predispose women to developing premenstrual dysphoric disorder.

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