



Research Article

Prevalence of Premenstrual Syndrome and Premenstrual Dysphoric Disorder Among Deaf/Hard-of-Hearing Women with Mood Disorders in Saudi Arabia

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ABSTRACT

The present study aimed to investigate the prevalence of premenstrual syndrome (PMS) and premenstrual dysphoric disorder among deaf/hard-of-hearing women with mood disorders in Saudi Arabia. The study sample comprised 380 deaf/hard-of-hearing women with mood disorders, and a convenient sampling method was used. For data analysis, descriptive statistics were used. Percentage, frequency and standard deviation, Chi-square test, unpaired t-test, one-way analysis of variance, and Pearson's correlation were used for quantitative and statistical logistic regression analysis. According to the Premenstrual Syndrome Scale, the prevalence of PMS (moderate to severe PMS) is 71.05%, and the prevalence of premenstrual dysphoric disorders is 16%. Women with moderate to severe PMS consume more French fries/snacks, more processed food, more candy, and less banana than women with low to moderate PMS do. They also have food with high sodium quantity and food with high carbs. They have more physical disease and pain during this period. They suffer more than others from diarrhea and loose stools during menstruation. They use benzodiazepines more than women with low to moderate PMS do.

KEYWORDS

premenstrual syndrome, premenstrual dysphoric disorder, deaf/hard of hearing, mood disorders

INTRODUCTION

Premenstrual syndrome (PMS) is characterized by physical and psychological symptoms, which start 1-2 weeks before menstruation, subside with the onset of menstrual flow, and are cyclical and recurrent. In addition to premenstrual tension, PMS can be severe enough to impact some aspects of a woman's life (Rezende et al., 2022). A systematic review and meta-analysis of the studies from different parts of the world reported a pooled prevalence of PMS of 47.8%, with a range of 12-98% (Direkvand-Moghadam et al., 2014).

Premenstrual dysphoric disorder (PMDD) is a more severe form of PMS which occurs in a small number of females and results in significant disability and loss of function (Shamnani et al., 2018). It is a psychosomatic

disorder provoked by changes in the levels of reproductive steroids accompanying the ovulatory menstrual cycle. It occurs about a week before the start of the period and begins to improve in the first days of the start of the period and becomes minimal or absent in the first week after the period, and is characterized by marked mood swings such as feeling sad, hypersensitivity and irritability (Halbreich et al., 2003), depressed mood and lack of pleasure, difficulty concentrating, fatigue and lack of energy, marked anxiety with tension and pressure, noticeable change in appetite such as an increased appetite for a certain type of food especially carbohydrates (Kumari Jha and Jha, 2022), excessive sleep or insomnia, physical symptoms such as pain or breast

swelling, muscle or joint pain, feeling bloated, and weight gain (Grover et al., 2019).

These symptoms lead to clinically significant distress in women and interfere with work, school, and regular social activities or relationships with others. Social activities diminish, and productivity and effectiveness at work and home decrease. Symptoms usually begin when the woman is at the beginning of her second decade of life, but the request for treatment comes after a long period that may extend to 10 years of suffering from these symptoms that may worsen continuously (Kumari Jha and Jha, 2022).

The cause of PMDD is unknown. Several neuroendocrine theories have been proposed for PMDD (Sattar, 2014). However, no single theory is entirely consistent internally, and no single treatment for this disorder has consistently been shown to be effective (Kumari Jha and Jha, 2022). Nevertheless, there is support for the use of SSRIs in females with PMDD and for the adult female population, SSRIs are considered the treatment of choice for managing severe PMS and PMDD. The mood symptoms associated with menstruation were attributed to the overproduction or underproduction of female hormones (Rapkin and Mikacich, 2013).

With the subsequent flourishing of assay, radiology, and laboratory techniques, it was found that several hormonal systems have been involved in causing premenstrual dysphoric disorder: hypothalamic-pituitary-gonadal axis, hypothalamic-pituitary-adrenal axis, hypothalamic-pituitary-thyroid axis, prolactin axis (Kumari Jha and Jha, 2022), prostaglandins, endorphins and biogenic amine neurotransmitters, perturbations related to chronobiology, which are perturbations in the timing or regulation of circadian rhythms (Raval et al., 2016).

Studies do not generally support the role of prostaglandins, nutrition (vitamin), or electrolyte disturbances as major causative factors in PMS patients. It has been observed that inhalation of carbon dioxide and lactate can induce a panic attack in panic disorder patients more quickly than their healthy counterparts; this indicates biological differences between the two groups and may be common weaknesses between patients with PMDD and those with anxiety or panic disorder (Tschudin et al., 2010). Therefore, the present study aimed to investigate the prevalence of PMS and PMDD among deaf/hard-of-hearing women with mood disorders in Saudi Arabia.

MATERIALS AND METHODS

Ethical approval for conducting this study was obtained from Tabuk University in Saudi Arabia in accordance with the Royal Decree in 2001. All procedures performed in this study were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The participants provided their written informed consent to participate in this study. A cross-sectional study was done among deaf/hard-of-hearing women with mood disorders in six cities around Saudi Arabia: Tabuk, Jeddah, Riyadh, Medina, Mecca, and Taif from February to August 2022.

The study sample comprised 380 deaf/hard-of-hearing women with mood disorders, and a convenient sampling

method was used. The sample size was calculated using the OpenEpi Version 2 (Atlanta, GA, USA) open-source epidemiological calculator with a hypothesized 15% ± 4% prevalence of PMS and PMDD at 99% confidence level. The design effect was kept one. The minimal sample size, which came on estimation at 95% confidence level, was 279. Deaf/hard-of-hearing women with mood disorders aged 14-24 years, having regular menstrual cycles (21-35 days), were

Table 1: Sociodemographic characteristics of the participants.

Variable N = 380	n	Mean ± SD (%)
Age		17.8 ± 9.27
Sex		
Females	380	100
Marital status		
Single	340	89.5
Married	35	9.2
Divorced/widowed	5	1.3
Occupation		
Student	210	55.2
Employed	110	28.9
Unemployed	25	6.6
Housewife	35	9.2
Education		
High school	170	44.7
Incomplete primary education	170	44.7
College certificate	40	10.5
Comorbidity		
None	60	15.8
Has one or more medical condition(s)	320	84.2
BMI category		
Underweight	80	21.1
Normal	200	52.6
Overweight	60	15.8
Obese	40	10.5
Health status		
Excellent/very good	92	24.2
Good	218	57.4
Fair/poor	70	18.4
Menstrual history		
Regular menstrual cycle	210	55.3
Number of days in a menstrual cycle (days)		5.7 ± 2.54
The most commonly used drugs		
Selective serotonin reuptake inhibitors	206	54.2
Physical symptoms that occur during the menstrual cycle		
Period pain	270	71.1
Liquid diarrhea	90	23.7
Aches	120	31.6
Headache	180	47.3
Length of diagnosis in psychiatry (years)		6.9 ± 7.20
Diagnosed with major depressive disorder	217	57.1

BMI, body mass index.

invited to participate in the study (see Table 1 for sociodemographic characteristics of the participants).

Data collection instrument

The Premenstrual Syndrome Scale (Algahtani and Jahrami, 2014) is a 23-question scale to assess the prevalence and severity of PMS symptoms. A five-point Likert scale (never, rarely, sometimes, often, and always) was used, and each answer had a given score. Each category's questions for each individual were calculated by its mean score, for which the composite score is extracted. Cronbach's value for the whole questionnaire in this study was high = 0.90.

Reliability and validity

The average variance extracted (AVE) value shows that all reflective constructs have AVE values > 0.50. Hence the coefficient of variation (CV) is valid and acceptable. All questions that measure construct have met the conditions of CV. Moreover, the composite reliability (CR) data results show that all values were above 0.8. This refers to high reliability. The results of Cronbach's alpha (CA) show high reliability. The data are shown in Table 2.

Table 2: Convergent validity and reliability.

	AVE	CR	CA
Questionnaire	0.788	0.826	0.765

AVE, average variance extracted; CA, Cronbach's alpha; CR, composite reliability.

Table 3: Factors associated with premenstrual syndrome (PMS).

Factors	No premenstrual syndrome		Have premenstrual syndrome		X2	P value
	Low to moderate PMS (n = 110)		Moderate to severe PMS (n = 270)			
N = 380	N	Percentage	N	Percentage		
French fries/snacks	52	47.27	122	41.48	3.645	0.021*
Processed food	49	44.55	112	41.48	4.254	0.020*
Chocolate	48	43.63	164	60.74	3.701	0.023*
Candy	39	35.45	158	58.52	4.201	0.022*
Banana	70	63.63	40	14.81	4.267	0.028*
High-sodium foods					15.112	< 0.001**
Low-sodium diet	80	72.72	30	11.11		
High-sodium diet	29	26.36	120	44.44		
High carbohydrate foods					9.645	0.005**
Low carb diet	80	72.72	30	11.11		
High carb diet	29	26.36	130	48.15		
Physical disease	32	29.09	137	50.74	4.006	0.041*
Period pain	36	32.72	180	66.67	11.465	0.001**
Regularity of the menstrual cycle	100	90.90	70	25.93	16.465	0.001**
Diarrhea, loose stools during menstruation	22	20	178	65.93	16.879	0.001**
Use of benzodiazepines	30	27.27	165	61.11	3.701	0.023*

* $P < 0.05$, ** $P < 0.01$.

Data analysis

For data analysis, descriptive statistics were used. Percentage, frequency and standard deviation, Chi-square test, unpaired t-test, one-way analysis of variance, and Pearson's correlation were used for quantitative and statistical logistic regression analysis.

RESULTS

Personal data of deaf/hard-of-hearing women with mood disorders

Of the 380 participants, it was found that most of them were aged between 14 and 24 years [mean = 17.8 years, standard deviation (SD) = 9.27], 340 were single (89.4%), 35 were married (9.2%), and five were divorced/widowed (1.3%). With regard to the physical symptoms that occur during the menstrual cycle, 270 (97.3%) had period pain, 90 (23.6%) had liquid diarrhea, 120 (31.5%) had aches, 180 (47.3%) had headache, 210 (55.2%) had a regular menstrual cycle, and the menstrual cycle (by days) lasted for 5.7 days (SD = 2.54). The mean years for being diagnosed in psychiatry (years) was 6.9 years ago (SD = 7.20). The most used drug was SSRIs ($n = 206$, 73.4%). 217 (57.6%) were diagnosed with major depressive disorder (see Table 1).

According to the Premenstrual Syndrome Scale, the prevalence of premenstrual syndrome (moderate to severe PMS) is 71.05%, and the prevalence of PMDD is 16%.

As shown in Table 3, women with moderate to severe PMS consumed more French fries/snacks, processed food,

Table 4: Factors predicting premenstrual syndrome in women with mood disorders using logistic regression analysis.

Factor	Adjusted OR	95% CI	P value
Chocolate consumption	2.883	1.266-5.565	0.010*
Banana consumption	2.001	1.013-4.034	0.020*
Regularity of the menstrual cycle	2.874	1.257-5.432	0.010*
Symptoms during menstruation			
Period pain	2.121	1.036-4.411	0.013*
Aches	2.001	1.013-4.034	0.020*
Use of benzodiazepines	2.001	1.002-3.132	0.021*

CI, confidence interval; OR, odds ratio; * $P < 0.05$.

candy, and less banana than women with low to moderate PMS. They also tend to have food with high sodium quantity and food with high carbs. They have more physical disease and pain during this period. They suffer more than others from diarrhea and loose stools during menstruation. They use benzodiazepines more than women with low to moderate PMS (see Table 3).

Using logistic regression analysis, it has been found that chocolate consumption, banana consumption, irregularities in the menstrual cycle, pain and aches during menstruation, and the use of benzodiazepines in women with mood disorders have been associated with PMS (see Table 4).

DISCUSSION

The present study aimed to investigate the prevalence of PMS and PMDD among deaf/hard-of-hearing women with mood disorders in Saudi Arabia.

Findings indicate that the prevalence of PMS (moderate to severe PMS) is 71.05% among deaf/hard-of-hearing women with mood disorders in Saudi Arabia, consistent with previous studies (Hong et al., 2012; Ko et al., 2013; Thaweesuksiri and Waleepakhon, 2013; Rezende et al., 2022).

Women with moderate to severe PMS consume more French fries/snacks, more processed food, more candy, and less banana than women with low to moderate PMS do. They also have food with high sodium quantity and food with high carbs. They have more physical disease and pain during this period. They suffer from diarrhea and loose stools more than others during menstruation. They use benzodiazepines more than women with low to moderate PMS do. This goes in the same line with previous studies in the literature (e.g., Rossignol and Bonnlander, 1991), which indicate that the consumption of chocolate has a relationship with PMS and foods that are sweet or have a portion composed of high sugar, such as doughnuts and candies are associated with PMS. Chocolate contains zinc, an essential substance in the ovary, to stimulate the secretion of progesterone and may be related to PMS and PMDD.

Consistent with Pearlstein (2012), it has been found that ingestion of complex carbohydrates increased tryptophan levels, and consuming tryptophan or a carbohydrate-rich, protein-poor meal increases the levels of tryptophan and

serotonin in the brain, thereby reducing the effects of PMS and PMDD. Therefore, according to Pearlstein (2012), consuming bananas, a complex carbohydrate, helps reduce PMS and mood disorders before menstruation.

When considering the relationship between high-sodium dietary habits with PMS and PMDD, it has been found that there is a statistically significant relationship between PMS and PMDD.

High-sodium diets should be avoided in women with PMS and PMDD. This aligns with the results of the study by Wilson' (2016) which stated that high blood sodium levels were associated with hypoglycemia. High estrogen also causes symptoms such as irritability, anger, anxiety, mood changes, sleep problems, breast engorgement, edema, headache, nausea and vomiting, menstrual pain, etc., corresponding to PMS and emotional state variability before menstruation.

In deaf/hard-of-hearing women with mood disorders, congenital disease, physical regularity of the menstrual cycle, abdominal pain, dysmenorrhea, aches, and diarrhea during menstruation are significantly associated with PMS. Biological factors, including the duration of the menstrual cycle, menstrual pain, headache, fainting, and aches and pains during the menstrual cycle, have a statistically significant relationship with PMDD, consistent with the study by Delara et al. (2013).

CONCLUSION

The prevalence of PMS (moderate to severe PMS) is 71.05% among deaf/hard-of-hearing women with a mood disorder in Saudi Arabia. Women with moderate to severe PMS consume more French fries/snacks, more processed food, more candy, and less banana than women with low to moderate PMS do. They also have food with high sodium quantity and food with high carbs. They have more physical disease and pain during this period. They suffer from diarrhea and loose stools more than others during menstruation. They use benzodiazepines more than women with low to moderate PMS do.

LIMITATIONS

This study found that dietary factors high in sodium and high in carbohydrates are associated with PMS and PMDD. However, this study did not detail the quantity, frequency, and duration of continuous consumption. This may be further studied for the benefit of other care of deaf/hard-of-hearing women with mood disorders in Saudi Arabia.

This research study was done only for deaf/hard-of-hearing women with mood disorders in Saudi Arabia. Therefore, the study population cannot be used as representatives of other populations which can be different.

Because this research is descriptive, it can only describe the prevalence and factors that play a role associated with PMS and emotional state premenstrual fluctuation without showing a causal relationship and the effect of mood disorders in the sample.

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AUTHOR CONTRIBUTIONS

The authors contributed equally to all parts of this paper.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest in association with the present study.

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