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PREVALENCE AND RISK FACTORS OF PREMENSTRUAL DYSPHORIC DISORDER AND PREMENSTRUAL SYNDROME AMONG MEDICAL STUDENTS OF TABUK UNIVERSITY

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ABSTRACT

Aim: The aim of this study was to assess the prevalence and risk factors of premenstrual dysphoric disorder (PMDD) and premenstrual syndrome (PMS) among medical students of Tabuk University.

Methods: This cross-sectional study was carried out at the Faculty of Medicine, Tabuk University. Saudi female medical students of any academic year, having regular menstrual cycles (21–35 days) and willing to participate in the study were recruited. Data were collected using a specially designed self-reporting questionnaire. According to the American College of Obstetricians and Gynecologists (ACOG), diagnosis of PMS was carried out. In contrast, PMDD diagnosis followed the Diagnostic and Statistical Manual of Mental Disorders-V (DSMV) criteria.

Results: The study included 117 participants. The prevalence of the PMS was 57.26%. Mild to moderate grade cases represented 31.6%, while 25.6% recorded the severe form. Sixty-seven students had PMDD criteria with a prevalence rate of 57.3%. The age of students showed a significant association with the development of both the PMS (p=0.025 and 0.014, respectively). Otherwise, there was no significant association between both disorders and each of high body mass index (BMI) \geq 27.5 kg/m2, family history of PMS, too many fast foods, coffee, tea, or smoking, as well as lack of regular exercise (p>0.05).

Conclusions: Premenstrual syndrome and PMDD are frequent among medical students at Tabuk University. Age was a significant risk factor; however, BMI, dietary and lifestyle factors, as well as family history of the conditions, showed no significant relationship.

Keywords: Premenstrual Syndrome, Premenstrual Dysphoric Disorder, Prevalence, Risk Factors, Medical Students, Tabuk, Saudi Arabia.

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INTRODUCTION

Premenstrual syndrome (PMS) and the most severe form of it, premenstrual dysphoric disorder (PMDD), are common problems in the reproductive age[1].

Premenstrual syndrome (PMS) is a cluster of physical and emotional changes that typically begins several days before the menstrual period and disappear quickly after menstruation. Symptoms range from mild to severe that may impact usual activities. Severe premenstrual syndrome happens in 5 to 8% of females; the majority of them also suffer from the premenstrual dysphoric disorder (20%-50%)[2].

Symptoms not only of mood and behavior changes but also of somatic complaints are encountered in this syndrome. Mood depression (dysphoria), tension or anxiety, lability affection, swings of mood, tearfulness, low interest in usual activities with lack of irritability. difficulties energy, in concentration, marked appetite changes with food craving or overeating, changes in sleep mode whether insomnia or hypersomnia and overwhelmed feeling. Such symptoms and complaints are very irritating. Sometimes these symptoms affect daily routine and impact social life, including relationships and worklife or school. Somatic symptoms, e.g., breast tenderness and bloating, can also be very distressing[3,4].

To fulfill the syndrome criteria, at least five of the previous symptoms should be encountered in the last week of the luteal phase of menstrual cycles for the past year. It should remit after the onset of the menstruation period and should be missed after menstruation. At least one symptom must be dysphoria, anxiety or tension, lability affection, or irritability. The first symptoms and interference with work and being unrelated to other disorders are the three criteria that should be confirmed for two successive cycles (at least) for the diagnosis of the syndrome.

The etiology of these disorders remains controversial. Various hypotheses include psychological biosocial and causes. endocrinological dysfunctions, altered endorphin modulation of gonadotropic secretion, exercise habits, smoking, use of altered transcapillary alcohol, fluid balance, oral contraceptive use, and a diet high in beef, refined sugar products, or caffeinecontaining beverages[5]

The aim of this study was to assess the prevalence and risk factors of premenstrual

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dysphoric disorder and premenstrual syndrome among medical students of Tabuk University.

MATERIALS AND METHODS

Study design, setting, and ethical considerations:

This cross-sectional study was carried out at the Faculty of Medicine, Tabuk University, Tabuk, Saudi Arabia, after ethical approval from the Ethics committee in Tabuk university Confidentiality was assured, and written informed consent was taken from each participant.

Eligibility criteria:

The study included Saudi female medical students of any academic year, having regular menstrual cycles (21–35 days) and willing to participate in the study and giving written informed consent.

Sample size and sampling technique:

The sample size was calculated using G*Power with a 95% confidence level and a 5% margin of error. One hundred eighty-seven students participated, but 117 were finally analyzed. The study used a convenience sampling technique to collect the predetermined sample size.

Data collection methods and instruments:

Data were collected using a specially designed self-reporting questionnaire that included four sections. The first section included demographic characters and contraception history, whereas the second section included inquiries about affective and physical symptoms of PMS graded as 1: mild, 2: moderate, and 3: severe. Participants were asked to rate the degree to which they experienced each symptom. One question was regarding "how many cycles were the PMS symptoms repeated." The third and fourth sections included inquiries about symptoms of PMDD and the possible risk factors related to the PMS and PMDD, respectively.

Diagnosis of PMS was accomplished according to the American College of Obstetricians and Gynecologists (ACOG), while PMDD diagnosis followed the Diagnostic and Statistical Manual of Mental Disorders-V (DSMV) criteria[2].

Statistical analysis:

The questionnaire responses were analyzed using the Statistical Package for the Social Science (SPSS Inc. Chicago, IL, USA), version 22. Continuous data were tested for normality and were represented as means and standard deviations. Independent T test was used for comparison between two groups. Categorical variables were described by frequencies and percentages. The descriptive analysis involved Chi-Square or Fisher's Exact tests as appropriate to test the significance of association between categorical variables. The level of significance was set at p < 0.05.

RESULTS

In the present study, a total of 187 female students belonging to the Faculty of Medicine, Tabuk University, responded to the questionnaire. Respondents who did not answer the question" How many cycles were the PMS symptoms repeated" were excluded (n=63). The presence of incomplete forms also mandated the exclusion of seven responses. Finally, 117 students were included in the analysis. Their mean age was 22.1±1.8 years, and their mean BMI was 24.25±4.77. The third and the fourth grades were more frequently represented (24.8% and 26.5%, respectively) (Table 1).

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Age (years)	Mean±SI)	22.1±1.8
Weight (Kg)	Mean±SI)	60.8±12.6
Height (cm)	Mean±SI)	158.4 ± 7.2
BMI kg/m ²	Mean±SI)	24.25 ± 4.77
	a 1	Ν	18
	Second	%	15.4%
	Thind	Ν	29
Academic year	Inira	%	24.8%
	Fourth	Ν	31
	Fourth	%	26.5%
	E:fth	Ν	14
	гни	%	12.0%
	Sixth	Ν	4
	SIXII	%	3.4%
	House	Ν	21
	officer	%	17.9%
History of contraceptive	No	Ν	117
pills use	INU	%	100.0%
Cumont controconting	No	Ν	117
	INO	%	100.0%

 Table 1. Demographic characters of the study participants (N=117)

The prevalence of the PMS was 57.26%. Mild to moderate grade represented 31.6%, while 25.6% recorded the severe form. Sixty-seven students had PMDD criteria with a prevalence rate of 57.3%, as shown in Table 2.

Table 3 shows the frequency of PMS symptoms. Concerning affective symptoms, moderate anxiety (28.0%) and irritability (27.1%) were more common, while severe angry outbursts (47.1%), nervous tension (32.4%), and depression (33.3%) were highly frequent. Confusion was mainly recorded as a mild grade (17.7%). Somatic symptoms included mainly mild headache (34.8%), mild to moderate weight gain (15.9% and 15%), mildly swollen extremities (9.4%), mild to moderate abdominal bloating (30.3% and 39.4%), and joint and muscle pain (28.2% and 36.8%). Breast tenderness was homogenously distributed among mild, moderate, and severe

	N=117	%
PMS		
No	50	42.5%
Mild to moderate	37	31.6%
Severe	30	25.6%
PMDD		
No	50	42.7%
Yes	67	57.3%

Table 2. Prevalence of PMS and PMDD among thestudy participants

grades (26.6%, 27.5%, and 27.5%, respectively).

Symptoms of PMDD are illustrated in Table 4. The presence of physical symptoms such as breast tenderness/swelling, joint or muscle pain, bloating, or weight gain in the week preceding menses was highly frequent (94%), followed by the feeling of lethargy and rapid fatigue (92.5%) and the feeling of being overwhelmed or out of control (91%).

Tables 5 and 6 show risk factors associated with the PMS and PMDD. The age of students showed a significant association with the development of PMS and PMDD (p=0.025 and 0.014, respectively). Otherwise, there was no significant association between both disorders and each of high BMI \geq 27.5 kg/m2, family history of PMS, too much fast foods, coffee, tea or smoking, and lack of regular exercise (p>0.05).

DISCUSSION

The present study is designed to assess the prevalence and severity of PMS and PMDD among a sample of medical students at Tabuk University. Further, to clarify the association

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	No		Mild		Mode	erate	Sever	e
	Ν	%	Ν	%	Ν	%	Ν	%
Anxiety	37	34.6%	29	27.1%	30	28.0%	11	10.3%
Irritability	28	25.7%	29	26.6%	30	27.5%	22	20.2%
Angry outbursts	3	2.9%	11	10.8%	40	39.2%	48	47.1%
Nervous tension	18	16.7%	29	26.9%	26	24.1%	35	32.4%
Depression	28	25.9%	24	22.2%	20	18.5%	36	33.3%
Confusion	66	58.4%	20	17.7%	10	8.8%	17	15.0%
Headache	49	43.8%	39	34.8%	16	14.3%	8	7.1%
Weight gain	66	58.4%	18	15.9%	17	15.0%	12	10.6%
Swollen extremities*	92	78.6%	11	9.4%	6	5.1%	4	3.4%
Breast tenderness	20	18.3%	29	26.6%	30	27.5%	30	27.5%
Abdominal bloating	14	12.8%	33	30.3%	43	39.4%	19	17.4%
Joint and muscle pain *	14	12%	33	28.2%	43	36.8%	19	16.2%

*Missing data

Table 3. Frequency of PMS symptoms among the study participants

with risk factors including age, BMI, dietary, and lifestyle factors among medical students of Tabuk University.

According to the ACOG criteria for the diagnosis of PMS, the prevalence of the PMS in this study was 57.26%. Mild to moderate grade represented 31.6%, while the frequency of the severe form of the PMS was 25.6%. In addition, following DSMV criteria for PMDD diagnosis, its prevalence was 57.3%.

Stresses may have a considerable role in the development of PMS/PMDD[6], and medical students are exposed to high during their academic study[7]. Therefore, the present study aimed to highlight the magnitude of these disorders among medical students.

According to ACOG criteria, a previous study that assessed young women in a university in Dammam, Saudi Arabia, reported 35.6% for the PMS, from which 22.4% were severe[8]. In the United Arab Emirates, the prevalence of PMS among university students was 35.3%[9]. A comparative study of college students in

Egypt revealed that 80.2% of the participants experienced various degrees of PMS symptoms[10]. Turkish medical students showed a high (91.8%) frequency of PMS[11]. In India, college students recorded a prevalence of PMS of 18.4%, were moderate to severe form was 14.7%, and PMDD was 3.7% according to DSM IV-TR criteria. In the same study, respondents' assessment according to ICD-10 diagnostic criteria explored much higher (91.4%) prevalence[12]. Another study in India reported PMDD of 37% of college students residing in hostels [13]. Studies from other Asian countries revealed inconsistent prevalence rates, where 55% of medical students in Iran described PMS according to DSMIV criteria[5]. About half (51%) of the medical college students in Pakistan met the requirements for PMS recording to ICD-10. Among them, 59.5% had mild PMS, 29.2% had moderate, and 11.2% had severe PMS, 5.8% had PMDD[14]. Much higher PMS rates (98.2%) were identified among the Pakistani population[15]. Among female university students in Jordan, a higher prevalence of PMS (92.3%) was reported, but the prevalence of

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	PMDD	PMDD				
	Yes 67 (57.3%)		No 50 (42.7%)			
	N	%	Ν	%		
Do you experience a fluctuating mood, notable feelings of sadness or hopelessness, irritability, and anger, and/or become extremely anxious?	67	100.0%	41	82.0%		
Do you notice that you lack interest in activities you usually enjoy?	57	85.1%	14	28.0%		
Do you find it more difficult to concentrate or focus on tasks?	46	68.7%	6	12.0%		
Do you feel lethargic or get tired more easily?	62	92.5%	21	42.0%		
Are you more likely to indulge in overeating or crave certain foods?	35	52.2%	11	22.0%		
Do you find yourself to be either excessively sleepy or unable to sleep during this time?	55	82.1%	22	44.0%		
Do you feel overwhelmed or out of control?	61	91.0%	15	30.0%		
Do you experience physical symptoms such as breast tenderness / swelling, joint or muscle pain, bloating, or weight gain?	63	94.0%	29	58.0%		
Are these symptoms associated with interference with work, school or usual social activities?	67	100.0%	27	54.0%		

Table 4. Frequency of PMDD symptoms among the study participants

PMDD was lower (7.7%) than in our study PMDD symptoms[16]. Most (64.6%) Japanese high school adolescent girls showed premenstrual symptoms[17]. Alternatively, adolescents in Canada showed a prevalence of severe PMS or PMDD as low as 29.6%[18].

The observed geographical variability in the prevalence of PMS may be attributed to differences in genetic, cultural, dietary, and lifestyle factors among the studied females. It might also be explained by the community-adopted practices before and during menstruation[19]. Additionally, differences in study methodology such as control for confounding variables, assessment methods, and the diagnostic criteria might play a role[20].

In the current study, the most common effective symptoms were moderate anxiety (28.0%), irritability (27.1%), severe angry outbursts (47.1%), nervous tension (32.4%), and depression (33.3%). On the other hand, somatic symptoms were mainly mild to moderate headache (34.8%), weight gain (15.9% and 15%), swollen extremities (9.4%), abdominal bloating (30.3% and 39.4%), and joint and muscle pain (28.2% and 36.8%). Breast tenderness was homogenously distributed among mild, moderate, and severe grades (26.6%, 27.5%, and 27.5%, respectively).

Comparable to our findings, Hashim et al.[9] reported muscle/joint/back pain and feeling angry as the most prevalent severe symptoms, while behavioral symptoms and breast tenderness were less common. Additionally, Goker et al.[11] found that abdominal bloating (89.5%), irritability (88.3%), and breast tenderness (82.6%) were the most frequent PMS symptoms among Turkish medical students. Another study reported a feeling of tiredness or lethargy (84%), depressed mood (72.3%), a sudden feeling of sadness or tearfulness (70.3%), anxiety (70%), backache (69%), and sleep problems (66%) as the most frequent symptoms[21].

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		PMS				
		Yes		No		P value
		Ν	%	Ν	%	
Age (years)		22.	.5±1.9	±1.9 21.7±1.6		0.025*
How many times you order fast food	>3	9	13.4%	4	8.0%	0.201
per week?	1-3	41	61.2%	26	52.0%	
-	I do not eat fast food	17	25.4%	20	40.0%	
High BMI (≥27.5)	No	48	71.6%	41	82.0%	0.194
	Yes	19	28.4%	9	18.0%	
Do you drink coffee and tea a lot?	No	18	26.9%	11	22.0%	0.547
	Yes	49	73.1%	39	78.0%	
Do drink more than 1.5 L of water	No	38	56.7%	31	62.0%	0.565
per day?	Yes	29	43.3%	19	38.0%	
Are you regular on your exercise?	No	58	86.6%	43	86.0%	0.930
	Yes	9	13.4%	7	14.0%	
Are you smoker?	No	63	94.0%	50	100.0%	0.134
-	Yes	4	6.0%	0	0.0%	
Any family member has similar	No	16	23.9%	16	32.0%	0.330
condition?	Yes	51	76.1%	34	68.0%	

*significant at p<0.05

Table 5. Risk factors associated with PMS

		PMDD				
		Yes		No		P value
		Ν	%	Ν	%	
Age (years)		22.	.5±1.8	21	.7±1.7	0.014*
How many times you order	>3	10	14.9%	3	6.0%	0.202
fast food per week?	1-3	39	58.2%	28	56.0%	
	I do not eat fast food	18	26.9%	19	38.0%	
High BMI (≥27.5)	No	48	71.6%	41	82.0%	0.194
	Yes	19	28.4%	9	18.0%	
Do you drink coffee and tea a	No	13	19.4%	16	32.0%	0.118
lot?	Yes	54	80.6%	34	68.0%	
Do drink more than 1.5 L of	No	37	55.2%	32	64.0%	0.340
water per day?	Yes	30	44.8%	18	36.0%	
Are you regular on your	No	57	85.1%	44	88.0%	0.649
exercise?	Yes	10	14.9%	6	12.0%	
Are you smoker?	No	63	94.0%	50	100.0%	0.134
	Yes	4	6.0%	0	0.0%	
Any family member has	No	18	26.9%	14	28.0%	0.892
similar condition?	Yes	49	73.1%	36	72.0%	

*significant at p<0.05

Table 6. Risk factors associated with PMDD

It is necessary to identify women at increased risk for PMS and PMDD in order to minimize them as well as for adequate management to improve their quality of life. Therefore, this work investigated a diversity of the possible risk factors. There was only a significant

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association between the age of participants and the PMS and PMDD. Other factors, including BMI, dietary, lifestyle, and family history of PMS, showed no significant relation.

Comparable studies from other populations showed inconsistent findings. In agreement with our findings, age was a significant risk factor for the PMS and the severity of its symptoms [22,23]. Some studies found no significant associations between physical exercise as well as anthropometric factors and PMS[9,24,25]. It's worth mentioning that our participants' average BMI was within the normal range, with the least number of participants having a high BMI. Furthermore, the lack of a significant association between caffeine intake and PMS symptoms in the present study agrees with the finding that caffeine and coffee intake are not associated with PMS[26]. Houghton et al.[27] also revealed that fat intake was not associated with higher PMS risk and that high intake of stearic acid may be associated with a lower risk of reporting PMS. Alternatively, Hashim et al.[9] identified a significant association between PMS smoking and and high calorie/fat/sugar/salt food consumption. Mishra et al.[13] also reported that PMDD was significantly associated with lifestyle factors such as sleep, physical activity, and too much tea and coffee intake. As well, Junk food significantly contributed to PMDD, as stated by Kamat et al.[28]. The frequency of the premenstrual symptoms was significantly associated with a maternal history of premenstrual syndrome, sedentary lifestyle, consumption of sweet-tasting and fast foods and coffee, exposure to passive smoking, and obesity[8,10,29]. Ashfaq R . [29] revealed that

the prevalence of PMS significantly increases in obese and overweight adolescent girls compere to healthy-weight girls.

Limitations:

The presented study has some limitations. The sample size was small, and the patients were not prospectively followed up. Retrospective and self-report studies of PMS have been shown to have a much higher prevalence of the condition compared to prospective ones. Though, conducting prospective studies exhibit inherent difficulties in such type of research[30].

CONCLUSION

Premenstrual syndrome and PMDD are frequent among medical students at Tabuk University. Age was a significant risk factor; however, BMI, dietary and lifestyle factors, and family history of the conditions showed no significant relationship.

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