Research Article

Prevalence of Premenstrual Syndrome and Its Effect on Academic Performance among Taibah University Student in Al Madinah

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Abstract

Background: Premenstrual syndrome is one of the common problems affecting female in different age groups and could affects the academic performance of students.

Aims of this study were to estimate the prevalence of premenstrual syndrome and determine its effect on school performance among university medical students.

Material and Methods: It was a cross-sectional study done in Al-Madinah city, Saudi Arabia including all female medical students from level 2 to 5, enrolled at Taibah University. Data were collected through self-administrated questionnaire. It contains 4 main parts: socio demographic characters of the students, menstrual and premenstrual characteristics, and premenstrual syndrome scale.

Results: The study included 257 students, with a response rate of 70.8%. Their age ranged between 18 and 29 years with an arithmetic mean of 21.8 years and a Standard Deviation (SD) of 1.8 years. According to the premenstrual syndrome scale score with a cut-off level of 111, the prevalence of PMS among female medical students was 65.4%. PMS was not significantly associated with students` academic performance. However, it is associated with premenstrual or menstrual pain (p<0.001), family history of premenstrual syndrome (p=0.016), dysmenorrhea (p=0.002) and severe back pain or cramps (p<0.001 and p=0.007, respectively).

Conclusion: Premenstrual tension syndrome is a prevalent alarming health problem affecting a great sector of female medical University students, Taibah University, Al-Madinah, Saudi Arabia. It affected the daily work of a considerable proportion of students. However, it did not impact their academic performance.

Keywords: Premenstrual tension syndrome; Prevalence; Academic performance; Medical students

Introduction

Menstruation is a natural phenomenon involving the discharge of blood from the uterus through the vagina, occurring at more or less regular monthly intervals during the reproductive life of female [1]. Normal menstruation first occurs in adolescents between 11 and 14 years of age, with a period length of 7 days or less, and a normal cycle length of 21 to 45 days with average blood loss of 20-80ml [2]. There are various types of menstrual disorders one of them is Premenstrual Syndrome (PMS).

Premenstrual Syndrome (PMS) is describing cognitive, physical, affective, psychological, and behavioral symptoms that occur during the luteal phase of the menstrual cycle and resolve quickly within a few days of the onset of menstruation. Premenstrual syndrome has different criteria by different organizations. The intensity of the symptoms varies among individuals and also between cycles in the same individual. Approximately 20-30% of premenopausal women exhibit PMS symptoms and 5-8% suffer from extreme psychological

disturbances that are classified as Premenstrual Dysphoric Disorder (PMDD) under Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV) [3].

While PMS is associated with 200 different symptoms, the underlying cause(s) remain unclear. It is believed that the trigger behind PMS is multifactorial in nature, with perturbations in reproductive hormone levels being one of the major causes. Hormonal fluctuations differ among women, which explain the differences in the severity of the symptoms.

Different hypotheses have been suggested for explanation how the PMS occurs such as thyroid dysfunction, genetic factors, hypoglycemia, hormonal imbalance, fluid retention, stress and psychological factors but mainly it occurs secondary to hormonal imbalance [4]. In addition, lifestyle habits like nutritional history and regular exercise could be linked with premenstrual syndrome [5]. Many studies showed that there is a strong association between the PMS and impaired quality of life among young age group women.

However, the quality of life is also affected by both social and working life. PMS also has an effect on the quality of sleeping [6]. The PMS among young adolescents' age groups girls could also affect their school performance and social interactions in a negative way. Approximately 80% of reproductive age women experience these symptoms pre-menstrual at some point in their lifetime [7].

PMS is associated with a lower positive academic affect and lower frontal rest asymmetry scores [8]. Which are themselves related to reward processing dysfunction, lower productivity, and an interference with studies, however, this has been less studied specially in Saudi Arabia. Thus this study was designed to estimate the prevalence of premenstrual syndrome and its effect on academic performance among Taibah university students in Madinah Saudi Arabia.

Methodology

This was a cross-sectional study conducted from July 2021 to December 2021, in the Taibah university, Madinah Al-Munawarah, which is located in northern Saudi Arabia. Female medical students were included from all academic years. According to the WHO sample size calculator, the sample size was 360. Data was collected through self-administered questionnaire.

It contains 3 main parts:

1. Socio demographic characters of the students.

2. Menstrual and premenstrual characteristics.

3. Premenstrual syndrome scale to define premenstrual tension syndrome.

It includes nine subscales; "depressive feelings, anxiety, fatigue, irritability, depressive thinking pain, changed appetite, changed sleep, and swelling subscales. The total PMS score was computed PMS (44-220). Students scored 111 or higher were regards as having premenstrual syndrome [9].

After obtaining approval from the research committee in Madinah, consent was taken from the program director of Joint Program of Family Medicine. The researcher distributed a questionnaire to students after taking their consent and explained and clarified it to them and the questionnaire was taken at the same time by the researcher from the respondents.

Data were analyzed using the Statistical Package for the Social Sciences version 26 (SPSS Incl., Chicago, IL). Qualitative variables were presented as frequency and percent. Quantitative variables were tested for normality distribution and were presented as mean and standard deviation. The Chi-square test was used for group comparison. This study considered variables statistically significant at $p < 0.05$.
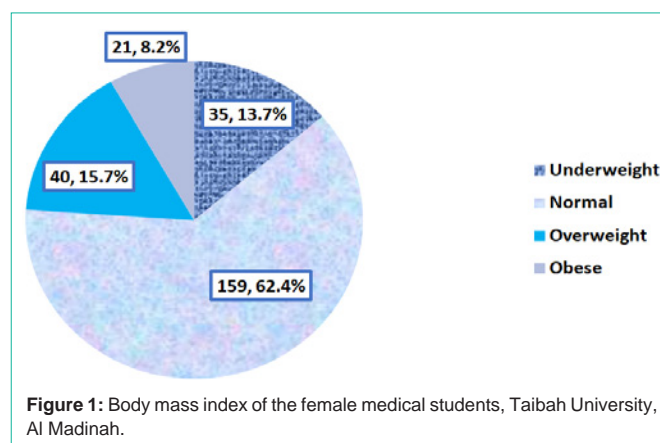
Results

The study included 257 students; out of a total targeted of 363 with a response rate of 70.8%. Table 1 summarized the Sociodemographic characteristics of the participants. Their age ranged between 18 and 29 years with an arithmetic mean of 21.8±1.8 years. Majority of them 248(96.5%) were Saudis and singles 243(95.6%). Only 7(2.7%) of the students had children. More than one-quarter 70(27.2%) were

Table 1: Sociodemographic characteristics of the participants (n=257).

	Frequency	Percentage
Nationality		
Saudi	248	96.5
Non-Saudi	9	3.5
Age in years		
Range	18-29	
Mean±SD	21.8±1.8	
Marital status		
Single	243	95.6
Married	14	5.4
Having children		
No	250	97.3
Yes	7	2.7
Academic level (year)		
2nd	53	20.6
3rd	53	20.6
4th	25	9.7
5th	56	21.8
6th	70	27.2
Grade point average (n=229)		
Range	3.45-5	
Mean±SD	4.53±0.34	

SD: Standard deviation

Figure 1: Body mass index of the female medical students, Taibah University, Al Madinah.

enrolled in the 6th academic year whereas only 9.7% were enrolled in the 4th academic year (Table 1 and Figure 1,2 and 3).

Table 2 summarizes the menstrual and premenstrual characteristics of the participants. The age of menarche ranged between 9 and 19 years with an arithmetic mean of 12.5 years and standard deviation of 1.4 years. Premenstrual or menstrual pain was mentioned by majority of the students (81.3%). Family history of premenstrual syndrome was reported by 40.5% of the respondents while using drugs for menstrual regulation was seen among 13.2% of them. Almost half of them (49%) had dysmenorrheal while severe back pain and cramps were reported by 23% and 35% of the students, respectively (Table 2).
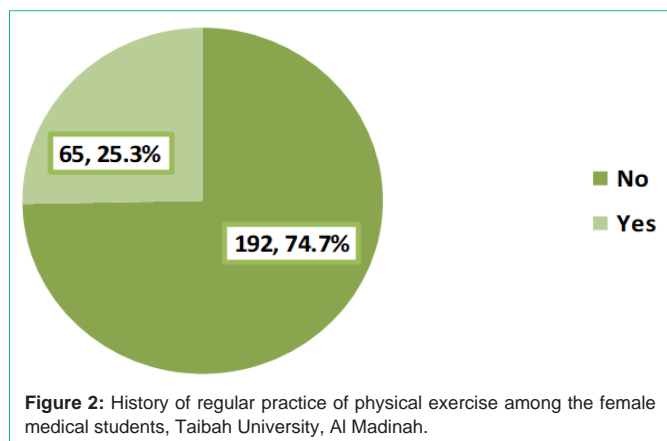
Figure 2: History of regular practice of physical exercise among the female medical students, Taibah University, Al Madinah.
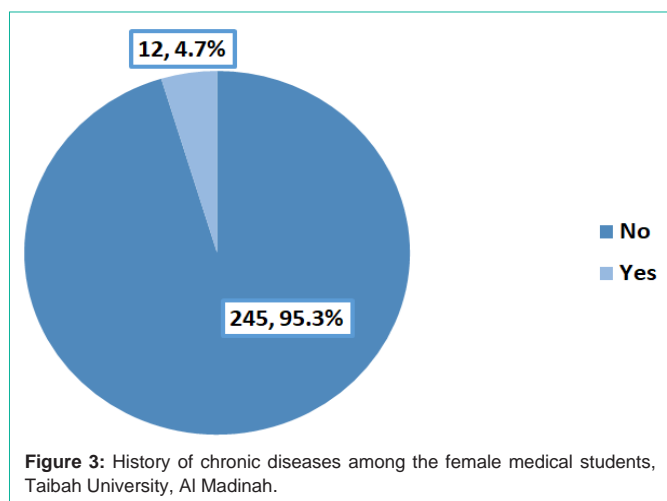

Figure 3: History of chronic diseases among the female medical students, Taibah University, Al Madinah.
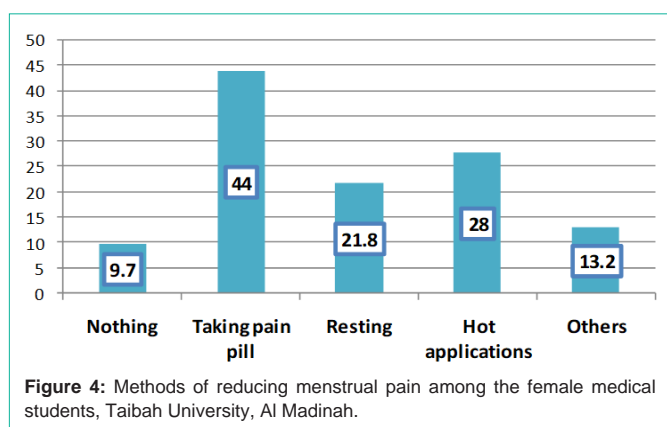
Table 2: Menstrual and premenstrual characteristics of the female medical students, Taibah University, Al Madinah.

	Frequency	Percentage
Age at menarche		
Range	09-19	
Mean±SD	12.5±1.4	
History of premenstrual or menstrual pain		
No	48	18.7
Yes	209	81.3
Family history of premenstrual syndrome		
No	153	59.5
Yes	104	40.5
Using drugs for menstrual regulation		
No	223	86.8
Yes	34	13.2
History of dysmenorrhoea		
No	131	51
Yes	126	49
Back pain during first two days of the period		
Mild	100	38.9
Moderate	98	38.1
Severe	59	23
Cramps during the first two days of the period		
Mild	58	22.6
Moderate	109	42.4
Severe	90	35

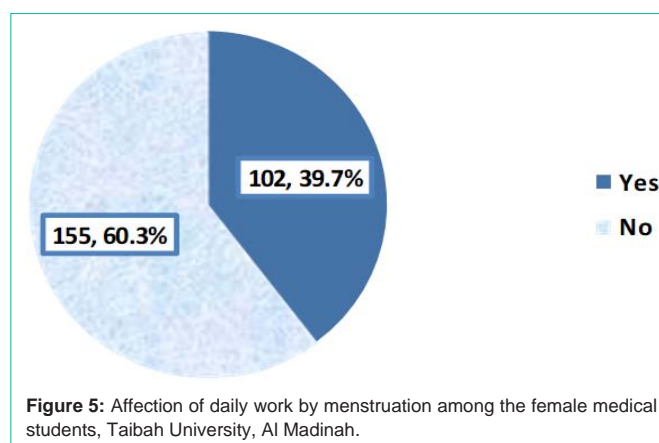**Figure 4:** Methods of reducing menstrual pain among the female medical students, Taibah University, Al Madinah.

Figure 5: Affection of daily work by menstruation among the female medical students, Taibah University, Al Madinah.

Taking pain pills (44%), hot applications (28%) and resting (21.8%) were the most frequently reported methods by students to reduce the menstrual pain (Figure 4 and 5).

According to the premenstrual syndrome scale score with a cut-off level of 111, the prevalence of PMS among female medical students was 65.4% as clear from Figure 6.

Almost two-thirds (66.4%) of students with no children compared to 28.6%) of those with children had PMS. However, this difference was borderline insignificant, p=0.051. Other studied

Sociodemographic factors (nationality, age, marital status, academic level, academic performance "GPA", regular practice of physical exercise and smoking) were not significantly associated with PMS (Table 3).

Most of students who had history of premenstrual or menstrual pain expressed PMS compared to their counterparts (70.8% *vs.* 41.7%), p<0.001. Students with family history of premenstrual syndrome were more likely to have PMS compared to their peers (74% *vs.* 59.5%), p=0.016. Similarly, students with dysmenorrhea were more likely to have PMS compared to others without such

Table 3: Socio-demographic factors associated with premenstrual tension syndrome among female medical students, Taibah University.

	Premenstrual tension syndrome		p-value
	No	Yes	
	N=89	N=168	
	N (%)	N (%)	
Nationality			
Saudi (n=248)	86 (34.7)	162 (65.3)	0.619**
Non-Saudi (n=9)	3 (33.3)	6 (66.7)	
Age in years			
Mean±SD	21.7±1.8	21.8±1.9	0.722⸸
Marital status			
Single (n=243)	83 (34.2)	160 (65.8)	0.506*
Married (n=14)	6 (42.9)	8 (57.1)	
Having children			
No (n=250)	84 (33.6)	166 (66.4)	0.051**
Yes (n=7)	5 (71.4)	2 (28.6)	
Academic level (year)			
2nd (n=53)	14 (26.4)	39 (73.6)	
3rd (n=53)	23 (43.4)	30 (56.6)	
4th (n=25)	10 (40.0)	15 (60.0)	0.400*
5th (n=56)	20 (35.7)	36 (64.3)	
6th (n=70)	22 (31.4)	48 (68.6)	
Grade point average (n=229)	81	148	
Mean±SD	4.56±0.34	4.52±0.35	0.333⸸
Regular practice of physical exercise			
No (n=192)	63 (32.8)	129 (67.2)	0.292*
Yes (n=65)	26 (40.0)	39 (60.0)	
Smoking			
No (n=251)	88 (35.1)	163 (64.9)	0.323**
Yes (n=6)	1 (16.7)	5 (83.3)	

*Chi-square test, **Fischer Exact test, ⸸Student t-test.

history (74.6% *vs.* 56.5%), p=0.002. Students with severe back pain or cramps were more likely to have PMS than those with mild degrees of both problems, p<0.001 and p=0.007, respectively (Table 4).

Table 5 shows the mean and standard deviation of the total and subscales of PMS score, in addition to rates of students scored over 50% in each. The highest one was observed regarding depressive thoughts and feeling (69.6%), followed by change in appetite (66.1%), fatigue (63.4%) and swelling (62.6%). The lowest percentage was observed regarding anxiety (44.4%). The mean total score was 120.01±29.39 (Table 5).

Discussion

In the present study carried out among medical students at Taibah University, Al-Madinah, Saudi Arabia, the prevalence of Premenstrual syndrome (PMS) was 65.4% according to the premenstrual syndrome scale score with a cut-off level of 111. This rate although high, is lower than that reported among Palestinian university students as all of

Table 4: Menstrual and premenstrual factors associated with premenstrual tension syndrome among female medical students, Taibah University.

	Premenstrual tension syndrome		p-value
	No	Yes	
	N=89	N=168	
	N (%)	N (%)	
Age at menarche			
Mean±SD	12.4±1.4	12.6±1.5	0.166⸸
History of premenstrual or menstrual pain			
No (n=48)	28 (58.3)	20 (41.7)	<0.001*
Yes (n=209)	61 (29.2)	148 (70.8)	
Family history of premenstrual syndrome			
No (n=153)	62 (40.5)	91 (59.5)	0.016*
Yes (n=104)	27 (26.0)	77 (74.0)	
Using drugs for menstrual regulation			
No (n=222)	82 (36.9)	140 (63.1)	0.062*
Yes (n=34)	7 (20.6)	27 (79.4)	
History of dysmenorrhoea			
No (n=131)	57 (43.5)	74 (56.5)	0.002*
Yes (n=126)	32 (25.4)	94 (74.6)	
Back pain during first two days of the period			
Mild (n=100)	51 (51.0)	49 (49.0)	
Moderate (n=98)	25 (25.5)	73 (74.5)	<0.001*
Severe (n=59)	13 (22.0)	46 (78.0)	
Cramps during the first two days of the period			
Mild (n=58)	28 (48.3)	3 (51.7)	
Moderate (n=109)	40 (36.7)	69 (63.3)	0.007*
Severe (n=90)	21 (23.3)	69 (76.7)	

*Chi-square test, ⸸Student t-test

Table 5: Description of the total and subscales scores and frequency of students receiving over 50% from subscales and total PMS score (n=257).

PMS score subscales	Range	Mean±SD	Girls receiving more than 50% from subscales N (%)
Depressive feeling (7 items)	7-34	20.08±6.02	179 (69.6)
Anxiety (7 items)	7-31	17.02±5.41	114 (44.4)
Fatigue (6 items)	6-30	16.82±4.53	163 (63.4)
Irritability (5 items)	5-25	12.88±4.22	143 (55.6)
Depressive thoughts (7 items)	7-35	20.73±6.30	179 (69.6)
Pain (3 items)	3-15	7.71±2.49	130 (50.6)
Changes in appetite (3 items)	3-15	8.57±2.49	170 (66.1)
Changes in sleeping habits (3 items)	3-15	7.80±2.64	134 (52.1)
Swelling (3 items)	3-15	8.40±2.85	161 (62.6)
Total score (44 items)	44-212	120.01±29.39	168 (65.4)

them had PMS symptoms of variable severity; 58.3% had moderate PMS whereas 17.1% had severe PMS symptoms in one study [10] while the other Palestinian study reported a rate of 71.9% [11].

Also in the United Arab of Emirates (UAE), all university students had PMS symptoms; 55% and 8% had moderate and severe PMS symptoms, respectively [12]. Very high rate also reported in Turkey among medical students (91.8%), [3] and in Dammam. Saudi Arabia among health sciences students as 91% of them suffering from some kind of menstrual problem; including irregular menstruation (27%), abnormal vaginal bleeding (9.3%), amenorrhea (9.2%), menorrhagia (3.4%), dysmenorrhea (89.7%), and premenstrual symptoms (46.7%) [7]. In Jordan, also a very high prevalence (92.3%) has been observed among University students [13]. However, our rate is higher than those reported by others. In another study carried out in Turkey, using the same tool applied in the present study with the same cut-off value (111), the prevalence among university students was 49.7% [14]. In Al-Ahsa, PMS was diagnosed in 35.6% of medical students [8]. In Ethiopia, a rate of 37% has been observed among college students [15]. In India, among medical students, also a rate of 37% has been recorded [16]. In Iran, the prevalence of PMS was 39.5% among medical students; more than half of them (60.6%) had mild, 25.1% had moderate and 14.2% had severe PMS [4].

In the current study, the highest reported domain of PMS was depressive thoughts and feeling, followed by change in appetite, fatigue and swelling and the lowest one was anxiety. In a similar Turkish study [14] using the same tool with the same cut-offs, the most frequent reported domain was changes in appetite, followed by irritability, swelling, fatigue, pain and depressive feelings in that order. Difference between the two studies could be explained by cultural difference. In another Turkish study, the commonest reported symptoms were abdominal bloating, irritability and breast tenderness. [3].

In the present study, PMS was not associated with Sociodemographic characteristics of the students. However, it was associated with premenstrual or menstrual pain, family history of premenstrual syndrome, dysmenorrhea and severe back pain or cramps. In a similar study carried out among medical students in Turkey, family history significantly affected the severity of PMS and quality of life of students [3]. In Iran, PMS was found to be significantly high in medical students who have positive history of PMS in their first degree relatives and who have used drugs to relieve PMS symptoms [4]. In Al-Hasa, older age medical students, those living in rural residence, with lower family income, family history of PMS, lower age at menarche, and irregularity of menses were more likely to be affected [8].

In the present study, PMS was not significantly associated with students` academic performance. However, more than one-third of the students (39.7%) reported affection of their daily work by menstruation. Similarly, other studies reported impact of PMS on women`s work activities [17-20]. Other studies observed negative impact of PMS on academic performance of students and explained this by the fact that university students, as a result of their stressful environment caused by their strive for higher academic achievement, may lack capabilities to manage their psychological and social demands and consequently suffer from more signs and symptoms of PMS [13,21].

Limitations of the present study including the implementation of the study in one University and among only medical students, which could influence the ability to generalize the findings over other universities and colleges in Saudi Arabia. Moreover, depending on a self-reported tool to diagnose PMS is considered a limitation, despite this tool is valid. Also, the applied tool did not classify cases according to their severity, which is important issue. Finally, the cross-sectional design, which proves only association and not causality between exposure and outcome, is considered one of the limitations. Despite those limitations, the study explored am important common health problem and investigated its impact on academic performance and other associated factors among a vulnerable sedctor of the Saudi community.

Conclusion

Premenstrual Tension Syndrome (PMS) is a prevalent alarming health problem affecting a great sector of female medical University students, Taibah University, Al-Madinah, Saudi Arabia. It affected the daily work of a considerable proportion of students. However, it did not impact their academic performance. PMS was not associated with Sociodemographic characteristics of the students. However, it was associated with premenstrual or menstrual pain, family history of premenstrual syndrome, dysmenorrhea and severe back pain or cramps. The highest reported domain of PMS was depressive thoughts and feeling, followed by change in appetite, fatigue and swelling and the lowest one was anxiety.

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