Premenstrual Syndrome and its Effect on Academic Performance of Medical Students, Suez Canal University

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ABSTRACT:

Background: Premenstrual syndrome (PMS) has a wide range of prevalence worldwide leading to higher rates of student absences from school and university, higher medical expenses, and lower health-related quality of life. **Objectives:** This study aimed to determine the prevalence of premenstrual syndrome among medical students at Suez Canal University and its effect on their academic performance. **Methods**: A cross-sectional study was conducted at Suez Canal University among medical students using a direct interview questionnaire from December 2023 to April 2024 after obtaining ethical approval from the ethical Committee (Reference number: 5484). A two-step sampling technique was used. The first step was the stratified sampling technique. The second step was an equi-proportional systematic random technique to select students from each year. Point estimate and 95% Confidence Interval were calculated. **Results**: The result showed that: from the studied sample of 410 students, the prevalence of PMS was 34.6% and that of PMDD was about 5 %. There is a high statistically significant difference regarding interference with school/work efficiency and social life activities. **Conclusions**: The prevalence of premenstrual syndrome among medical students was high enough and it has a great effect on academic performance.

Keywords: Premenstrual syndrome, academic achievement, female medical students.

Introduction

Premenstrual Syndrome (PMS) is defined by the International Statistical Classification of Diseases and Related Health problem 10th Revision (ICD-10) as the occurrence of one premenstrual symptom in a list of symptoms which restricted to the luteal phase of the menstrual cycle and ceases with the commencement of menstrual flow. ⁽¹⁾ The symptoms present a cyclic and recurrent character with variable in quality and intensity and improved when the menstrual flow begins (2, 3)

The most severe form of PMS is premenstrual dysphoric disorder (PMDD), which is characterized by the presence of at least five symptoms (one of which must be affective) that occur in the late luteal phase. (4-6)

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The worldwide prevalence of PMS varies between 12% and 98%. among university students. While PMDD prevalence ranges from 1-5%.⁽⁷⁻⁸⁾

According to the World Health Organization, 20–31% of university female students worldwide have at least one mental disorder associated with menstruation. ⁽¹⁰⁻¹¹⁾

Some studies have also found that PMDD and PMS do negatively affect female students' academic performance. ⁽⁹⁾ and this effect contributes to an increased level of psychological stress among university students, which may exacerbate symptoms of PMDD and PMS. ⁽¹²⁾

The present study aims to examine the prevalence of premenstrual syndrome (PMS and PMDD), and their relationship with academic performance among female medical students, at Suez Canal University.

Subjects and Methods

This is cross-sectional study was used to examine the prevalence and association of PMS with academic performance among female medical students, at Suez Canal University. Total sample sizes of 410 students included in the study, from December 2023 to April 2024.

The sample size was determined by using the equation of one proportion: ⁽¹³⁾

$$n = \left[\frac{Z_{\infty/2}}{E}\right]^2 * P(1 - P)$$

Where n = sample size, $Z\alpha/2 = 1.96$ (the critical value that divides the central 95% of the Z distribution from the 5% in the tail), P = 42% (the proportion of the outcome variable). ⁽¹⁴⁾

, and E = 0.05, the margin of error (width of confidence interval).

After adding a 10% dropout rate the total sample size will be 410 students.

Sampling method: first step; stratified sampling technique; Medical students were classified into 5 strata from 1st to 5th year. second step: systematic sampling technique (using the equi-proportional method) was used to select students from each year

In the academic year 2023-2024 Total number of female medical students in SCU was 955 students.

1st year=210 female (22%) 2nd year=190 female (21%) 3rd year=220 female (23%) 4th year=188 female (19%) 5th year=147 female (15%)

The questionnaire consists of three parts:

Part 1: Cover socio-demographic, lifestyle, and reproductive data such as age, weight, height, BMI, age of first menarche, length of menstrual cycle, duration of bleeding period....etc.

Part 2: Premenstrual Symptoms Screening Tool (PSST): This is an instrument designed by Özdel *et al.* (2015) ⁽¹⁵⁾ to identify the students who suffer from PMDD based on modified DSM-5 criteria. It consists of two sections:

- The first section is a checklist that consists of 14 items that inquire about the experience of the premenstrual symptoms.
- The second section consists of five items. The students were asked if these symptoms interfere with productivity, relationships with co-workers and their families, and social life activities. The two sections are rated on a five-point scale

Part 3 is the Academic performance measured using the students' Involvement Scale developed by Christopher McGregory ⁽¹⁶⁾ this scale contains 8 questions about academic performance during the menstrual period that were answered using the 5-point scale.

Ethical Considerations

The study protocol was approved by the local ethics committee (research 5484). Each participant was asked to give oral and written consent to participate in the study after a full explanation of the nature of the study. Confidentiality was ensured.

Results

Data were analyzed using Statistical Program for Social Science (SPSS) version 24. Qualitative data were expressed as frequency and percentage. Quantitative data were expressed as mean ±SD for normally distributed data or median (IQR) for not normally distributed data.

Table 1 shows the description of the demographic data of the studied members. The mean age was 20.5 ± 1.48 years with minimum age of 18 years and maximum age of 24 years. As regards BMI, there were 345 non-obese members (84.1%) and 65 obese members (15.9%) in all studied members.

Table 2 shows no statistically significant difference between study members in age, while there was a high statistical difference (P-value < 0.001) between PMS and PMDD as regards residence and obesity as it increased in rural communities, as well as in obese students.

Figure 1 the result showed that the prevalence of PMS was 34.6 % and that of PMDD was about 5 %.

Table 3 shows that patients with PMSand PMDD significantly interfere withschool/work efficiency. As well as social lifeactivities (P-value < 0.001)</td>

Table 4 shows that; the academicperformance scale is highly affected by

PMDD and decreased total score of the academic performance scale in members with PMS.

Table 5 shows a strong correlationbetween both PMS and PMDD and pooracademic performance scores (P-value <</td>0.001).

Discussion

This study found that the prevalence of PMS among female university students was 34.6% and that of PMDD was 5%. The prevalence of PMDD in this study is low compared with the 10.2% observed in the Jordanian study.⁽¹⁷⁾

The difference in the rates is probably due to the different targets of the sample in this study. In the Hamaideh *et al.* study (2014), ⁽¹⁷⁾ the target is females from different age groups; however; this study focuses on university-age females.

Thus. stressor and cultural types perspectives of females' roles and responsibilities play vital roles. In this study, those factors can explain the significant difference (p-value < 0.001) regarding residence. Several other studies also reported that menstrual disorders caused defects in social life and a decrease in academic performance. (18-19)

This study shows the interference of PMS with work efficiency, this is consistent with

many studies. In a study on 125 office workers in the UK, more than 90% reported some PMS symptoms and 40% suffered from PMS syndrome. ⁽²⁰⁾

In a study on 117 female doctors in Port Said in Egypt ⁽²¹⁾, the prevalence of PMS was reported to be 50.7%. This relatively high prevalence could be because female doctors are facing more stress from the workload and trying to keep a balance between work and family.

This is also consistent with another study in Amman that demonstrated a significant correlation between moderate to severe PMS and limitations in the performance of daily activities, such as shopping, and cooking.⁽²²⁾

Conclusion and recommendations

As PMDD and PMS symptoms have a great effect on the academic performance level of female medical students in Ismailia, family physicians have to develop PMS health education and screening programs at all educational levels.

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Tables

Variable		Studied patients				
		(N = 410)				
Age (years)	Mean ±SD	20.5 ± 1.48				
	Min - Max	18 - 24				
Residence	Rural	205	50%			
	Urban	205	50%			
Marital status	Single	405	98.8%			
	Married	5	1.2%			
Socioeconomic	Low	152	37.1%			
status	Middle	175	42.7%			
	High	83	20.2%			
BMI	Non-obese	345	84.1%			
	Obese	65	15.9%			
Menarche	< 12 years	195	47.6%			
	12 – 14 years	164	40%			
	> 14 years	51	12.4%			
Dysmenorrhea	Yes	286	69.8%			
	No	124	30.2%			
Family history	Positive	160	39%			
	Negative	228	55.6%			
	Unknown	22	5.4%			

Table (1): Demographic characteristics of the sample (N=410)

Variable		Studied patients (N = 410)		PMS		PMDD		Test	P.value
				Yes	No	Yes	No		
Age	Mean ±SD	20.5	20.5 ± 1.48		19-22	19-	19-22	MW =	= 0.247
(years)	Min Mon	10	24	_		22.5		3962	
	willi - wiax	18 - 24							
Residence	Rural	205	50%	115	90	21	184		
				81%	33.6%	100%	47.3%	$V^2 - 83.4$	~ 0.001
	Urban	205	50%	27	178	0	205	$\Lambda = 03.4$	< 0.001
				19%	66.3%	0%	52.7%		
Marital	Single	405	98.8%	142	262	21	384		
status				142	205	100%	98.7%	V ² 0.27	0 601
	Married	5	1.2%	0	5	0	5	$\Lambda = 0.27$	0.001
				0%	1.9%	0%	1.3%		
Socioecon	Low	152	37.1%	95	57	0	152		
omic				96.1%	21.3%	0%	39.1%		
status	Middle	175	42.7%	20	155	0	175	$x^2 - 26$	0 101
				14.1%	57.8%	0%	45%	$\mathbf{A}^{-} = 2.0$	0.101
	High	83	20.2%	27	56	21	62		
				19%	20.9%	100%	15.9%		
BMI	Non-obese	345	84.1%	115	230	0	0		
				81%	85.8%	0%	0%	$X^2 = 60.4$	< 0.001
	Obese	65	15.9%	27	33	5	0	11 - 00.4	< 0.001
				19%	50.7%	7.6%	0%		

Table (2): Difference between PMDD and PMS groups related to demographics (N=410)

Interference with		PMS					
		Yes		No		X ²	P-value
		(N =	: 142)	(N =	= 268)		
School/work	Mild	0	0%	247	92.2%	331.5	< 0.001
efficiency	Moderate	27	19%	0	0%		
	Severe	115	81%	21	7.8%		
Relations with	Mild	0	0%	247	92.2%	111.5	0.08
friends	Moderate	115	81%	21	7.8%		
	Severe	27	19%	0	0%		
Relations with	Not at all	0	0%	247	92.2%	129.1	0.11
family	Moderate	142	100%	21	7.8%		
Social life	Mild	0	0%	247	92.2%	329.2	< 0.001
activities	Moderate	142	100%	21	7.8%		
Home	Mild	0	0%	247	92.2%	163.2	0.9
responsibilities	Moderate	142	100%	21	7.8%		

Table (3): Correlation between PMS and premenstrual symptoms effects. (N=410)

 X^2 : Chi-square test. HS: p-value < 0.001 considered highly significant

		PMDD					
Interference with		Yes		No		\mathbf{X}^2	P-value
		(N :	= 21)	(N =	= 389)		
School/work	Not at all	0	0%	247	63.5%	44.5	< 0.001
efficiency	Mild	0	0%	27	6.9%		
	Moderate	21	100%	115	29.6%		
Relations with	Not at all	0	0%	247	63.5%	44.5	< 0.001
friends	Mild	21	100%	115	29.6%		
	Moderate	0	0%	27	6.9%		
Relations with	Not at all	0	0%	247	63.5%	33.5	< 0.001
family	Moderate	21	100%	142	36.5%		
Social life	Mild	0	0%	247	63.5%	33.5	< 0.001
activities	Moderate	21	100%	142	36.5%		
Home	Mild	0	0%	247	63.5%	33.5	< 0.001
responsibilities	Moderate	21	100%	142	36.5%		

Table (4): Correlation between PMDD and the effect of premenstrual symptoms. (N=410)

 X^2 : Chi-square test. HS: p-value < 0.001 considered highly significant.

Variable		Positive	Negative	Test	P-value
Academic	Poor	142(100%)	21(7.8%)	$X^2 = 329.2$	< 0.001
PMS	Excellent	0(0%)	247(92.1%)		
Academic	Poor	21(100%)	142(36.5%)	$X^2 = 33.5$	< 0.001
PMDD	Excellent	0(0%)	247(63.5%)		

Table (5): Correlation between PMS, PMDD and academic performance scale. (N=410)



Figure 1: Prevalence of PMS and PMDD in studied sample (N=410)

الملخص العربي

متلازمة ما قبل الحيض وتأثيرها على التحصيل الاكاديمي لطالبات الطب بجامعة قناة السويس

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الخلفية : متلازمة ما قبل الحيض تتمتع بنطاق واسع من الانتشار حول العالم، مما يؤدى إلى ارتفاع معدلات غياب الطلاب عن المدرسة والجامعة، وزيادة النفقات الطبية، وانخفاض جودة الحياة المتعلقة بالصحة . و لماله من أهمية قصوى في الارتفاع بالمستوى الاكاديمي لطالبات كلية الطب فقد كانت العينة من طالبات كلية الطب بجامعة قناة السويس. الهدف من البحث: تحسين جودة التحصيل الأكاديمي لطالبات كلية الطب التابعة لجامعة قناة السويس. أغراض البحث: ١- قياس مدى انتشار متلازمة ما قبل الحيض بين طالبات كلية الطب جامعة قناة السويس. ٢- تقييم تأثير متلازمة ما قبل الحيض على التحصيل الأكاديمي لطالبات كلية الطب بجامعة قناة السويس. طريقة البحث: أجريت در اسة إكلينيكية مقطعية وصفية شاملة، حيث تم ملء استمارة استبيان تحوى بيانات عن الخصائص الديمو غرافية بما في ذلك العمر ومحل الاقامة (ريف وحضر) وكذلك الحالة الاجتماعية ومستوى المعيشة ...الخ بالإضافة إلى بعض الأسئلة عن الدورة الشهرية ومدى انتظامها وكذلك تاريخ مرضى عائلي. ثم تم استخدام PSSTكوسيلة لتشخيص متلازمة ما قبل الحيض وتلا ذلك استخدام academic performance scale لتقييم التحصيل الأكاديمي لطالبات كلية الطب أثناء فترة الدورة الشهرية. واشتملت العينة على عدد ٤١٠ طالبة من طالبات الكلية موزعة بالتساوي على سنوات الدراسة بالكلية وهم خمس سنوات وبالتالي العينة كانت ٨٢ طالبة من كل صف در اسى. التحليل الإحصائي: خضعت البيانات المجمعة للعمليات الإحصائية المناسبة ومثلت هذه البيانات والإحصائيات في الجداول والأشكال المناسبة. الاعتبارات الأخلاقية: تم اخذ موافقة المشاركين قبل بدء التقييم وسرية البيانات كانت مكفولة. النتائج: - أظهرت نتائج البحث أن متلازمة ما قبل الحيض منتشرة بنسبة ٣٤,٦ بالمائة بينما الحالات الاشد خطورة وتسمى PMDD كانت نسبتها ٥ بالمائة. - وقد أوضحت الدراسة أن محل الاقامة وكذلك معدل كتلة الجسم لهما تأثير على متلازمة ما قبل الحيض لدى الطالبات. - وقد تبين أن أكثر الطالبات يتأثرون بمتلازمة ما قبل الحيض على مستوى التحصيل الدراسي بنسبة قد تصل الي ١٠٠ بالمائة. - وقد أوضحت الدراسة أن الطالبات بمتلازمة ما قبل الحيض يتأثرن بشكل كبير على المستوى الاجتماعي والعلاقات بين الأهل في فترة الحيض. التوصيات: ١- عمل بحث موسع للاكتشاف المبكر لمتلازمة ما قبل الحيض على مستوى الجامعة. ٢- الاخذ في الاعتبار مدى تأثير متلازمة ما قبل الحيض على الطالبات من حيث التحصيل الدر اسى وكذلك الحالة النفسية والعلاقات الاسرية وتعديل بعض قوانين العمل بما يتناسب مع ذلك .