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Premenstrual Syndrome Among Female Medical Students of Univerisiti Malaysia Sabah

Ohnmar Thwin¹, Daw Khin Saw Naing^{2, *}, Win Win Min¹, Soe Aung³, Ahmad Faris Bin Abdullah²

¹Reproductive Health Department, Faculty of Medicine and Health Sciences, Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia

²Department of Community & Family Medicine, Faculty of Medicine and Health Sciences, Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia

³Department of Obstetrics and Gynaecology, University of Medicine (1), Yangon, Myanmar

Email address

naing53@gmail.com (DKS. Naing)

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Abstract

The premenstrual syndrome (PMS) is particularly common in the younger age groups, posing a significant public health problem among young girls. It was noted that, among the female students, PMS was a frequent reason for seeking care at the in-house health clinics of Universiti Malaysia Sabah (UMS). The Faculty of Medicine and Health Sciences (FPSK) took an initiative to explore this problem as the health and quality of life of students are the major concerns of UMS. A cross-sectional study was conducted with 211 female medical students of FPSK to determine the prevalence of premenstrual syndrome (PMS) and to investigate its associated factors. American College of Obstetrics and Gynaecology (ACOG) PMS-criteria-based questionnaires were used. The mean age of students under study was 20.94±0.92 and 51.65% responded to have experienced PMS. Among the somatic symptoms, 70.6% of the studied females complained of breast tenderness, 62. 4% of abdominal bloating, 39.4% of headache and 2.8% of swelling of extremities. Common behavioural symptoms were irritability (80.7%), angry outbursts (66.1%), depression (57.8%), anxiety (53.2%), social withdrawal (31.2%), and confusion (24.8%). Among the reported symptoms; headache, confusion, irritability, social withdrawal, anxiety and swelling of extremities were significantly associated with PMS. However, the relationships between PMS and disturbances in students' daily physical and mental activities were not statistically significant. As the prevalence estimated by this study was quite high, in-depth studies on PMS of female UMS students need to be conducted.

1. Introduction

Premenstrual Syndrome (PMS) is a condition which manifests with distressing physical, behavioral and psychological symptoms, in the absence of organic or underlying psychiatric disease, which regularly recurs during the luteal phase of each menstrual (ovarian) cycle and which disappears or significantly regresses by the end of menstruation.[1] Typical psychological symptoms include mood swings, irritability, depression and feeling out-of-control. Physical symptoms include breast tenderness, bloating and headaches. Behavioral symptoms include reduced visio-spatial and cognitive ability and an increase in accidents.[1] The American College of Obstetrics and

Gynaecology (ACOG) published the *ten diagnostic criteria* for PMS. PMS was considered if *at least one of the six affective and one of the four somatic symptoms were reported* five days prior to the onset of menses in the three prior menstrual cycles and ceased within four days of onset of menses.[2] The symptoms must not be an exacerbation of a psychiatric disorder such as depression, a panic disorder or personality disorder. If the syndrome is very severe and the symptoms are mainly psychological, it is classified as premenstrual dysphoric disorder (PMDD), which is the extreme psychological end of the PMS spectrum.[3]

Premenstrual syndrome is not due to a single factor. Genetic, environmental, and psychological factors would influence on mood disorders and hormonal fluctuations. It is estimated that 95% of women suffers from premenstrual symptoms and 5% would suffer from PMS.[3] The precise aetiology of PMS remains unknown. But the cyclical ovarian activity and the effect of estradiol and progesterone on the neurotransmitters like serotonin and gamma-amino butyric acid (GABA) appear to play key roles. Absence of PMS before puberty, during pregnancy and after the menopause supports the theory that cyclical ovarian activity is important. There are no tests to diagnose PMS. It is suggested that the diagnosis of PMS should be made following prospective symptom rating using validated tools. The calendar of premenstrual experience (COPE) and the daily record of severity of problems (DRSP) are frequently used tools for measuring PMS symptoms in a routine clinic.[4]

The premenstrual syndrome (PMS) is particularly common in the younger age groups and therefore presents a significant public health problem among young girls.[5] In the yearly review of clinic attendances at the in-house health clinics of Universiti Malaysia Sabah (UMS), PMS was noted to be a frequent reason for seeking care by female students. As the UMS placed special concern on the health and wellbeing of its students, the Faculty of Medicine and Health Sciences (FPSK) took an initiative to assess the magnitude of PMS among its 250 female medical students.

This study was conducted to estimate the prevalence, severity and determinants of premenstrual syndrome (PMS) among female medical students in FPSK, UMS.

2. Materials and Methods

2.1. Subjects and Setting

This is a cross-sectional study conducted from 1st October 2012 to 31st March 2013. All female medical students studying in the Faculty of Medicine and Health sciences during the study period were included only after obtaining individual student's informed consent to participate in this study. The Students with current medical, psychiatric or gynaecological problems including pregnancy, amenorrhea and significant pelvic pain secondary to a proven or presumptive diagnosis of pelvic inflammatory disease or endometriosis were excluded from the study. So also were known cases of fibro adenoma or fibroadenosis of breast.

2.2. Instruments and Data Collection

The students who met the inclusion criteria were explained about the study objectives and participant's obligations to fill in the self-administered questionnaires for at least three consecutive menstrual cycles. The content of the questionnaires were clearly spelled out to all potential participants before obtaining their consent. Explanations were given and written informed consent was requested from them. All the consented students were then screened for exclusion criteria. Only those consented students who were free from exclusion criteria were provided with self report forms.

The forms consisted of three parts covering personal data, symptoms of PMS and impairment of daily activities during premenstrual period. The first section placed emphasis on socio-demographic and reproductive data like age, height, weight, age at menarche, regularity of menstruation, duration (in days) of menstrual bleeding, amount of bleeding, family history of PMS, physical activity, smoking, caffeine intake and alcohol drinking. The second part focused on somatic and behavioural symptoms as per ACOG PMS diagnostic criteria. Participants were deemed to meet the criteria if they rated their experience of at least one of the six behavioural symptoms and one of the four somatic symptoms. They were asked to record the start date and end date of the symptoms in relation to the onset of menses. The third part of the questionnaires was to record for any impairment in physical and mental activities during premenstrual 5 days as well as during menstruation. It covered limitation of daily activities, disturbances in concentration during class time, effect on school attendance, and disturbances in performing daily household chores.

Table 2.2.1. ACOG PMS criteria.

Behavioural symptoms	Somatic symptoms
Depression	Breast tenderness
Angry outbursts	Abdominal bloating
Irritability	Headache
Anxiety	Swelling of extremities
Confusion	
Social withdrawal	

All the questionnaires were self-reported and were completed by the participants for at least three consecutive menstrual cycles. The questionnaires were collected from students starting from January till end of March, 2013. If they did not experience any symptoms during the first three months, the students were allowed to record for another three months. The presence or absence of PMS was based upon the symptoms appearing within five days before the menses. PMS was diagnosed only if those symptoms were relieved within four days of the onset of the menses without recurrence until day 13 of menstrual cycle and were experienced for two consecutive cycles.

2.3. Statistical Analysis

Collected information was analyzed using Statistical Package for Social Sciences (SPSS) software. Different socio-demographic, biological and reproductive variables were presented, compared and analyzed using independent 't' test for continuous and ordinal variables and chi square test for categorical variables. Variables that were found to be significantly associated with the prevalence of PMS on this initial analysis by the chi square test were introduced into the regression analysis model. A 'p' value of ≤ 0.05 was considered significant.

3. Results

PMS was diagnosed using the ACOG PMS criteria in 109 (51.65%) out of 211 respondents. The pertinent clinical and socio-demographic characteristics of the study population were given in Table 3.1. Only 30% of students came from rural areas and the rest were of urban origin.

		Cases N (%)	Non-cases N (%)	Statistics	P value ≤
Age in years: (mean ±SD)		20.94±0.92	20.54±1.2	32.22 (t)	0.000
	18-19	39 (35.8%)	51 (55.4%)		
Age groups:	19-20	45 (41.3%)	23 (25%)		
	20-21	25 (21.9%)	18 (19.6%)		
Devidence	Urban	77 (70.6%)	64 (69.6%)	$X^2 = 0.147$	0.702
Kesidence	Rural	32 (29.4%)	28 (30.4%)		
A	<= 12	66 (60.6%)	53 (57.6%)	40.45 (t)	0.000
Age at menarche (years)	>12	43 (39.4%)	39 (42.4%)	$X^2 = 7.567$	0.006
	< 30	103 (94.5%)	85 (92.4%)	61.218 (t)	0.000
Body mass index:	\geq 30	6 (5.5%)	7 (7.6%)	$X^2 = 152.36$	0.000
	Irregular	25 (22.9%)	16 (17.4%)		
Regularity of menstruation:	Regular	84 (77.1%)	76 (82.6%)	$X^2 = 199.69$	0.000
	<3	3 (2.8%)	1 (1.1%)	81.49 (t)	0.000
Duration of menstrual bleeding	3-7	94 (86.2%)	79 (85.9%)	$X^2 = 250.11$	0.000
(days):	>7	12 (11.0%)	12 (13.0%)		
	<average< td=""><td>52 (47.7%)</td><td>40 (43.5%)</td><td>35.26 (t)</td><td>0.000</td></average<>	52 (47.7%)	40 (43.5%)	35.26 (t)	0.000
Amount of menstrual bleeding:	Average	43 (39.4%)	46 (50%)	$X^2 = 49.12$	0.000
-	>average	14 (12.8%)	6 (6.5%)		
Family history of PMS: (Sister/	Absent	53 (48.6%)	58 (63%)	$X^2 = 21.041$	0.153
mother)	Present	56 (51.4%)	34 (37%)		
	Limited	53 (48.6%)	37 (40.2%)	$X^2 = 2.42$	0.120
Physical activity	Unlimited	56 (51.4%)	55 (59.8%)		

Table 3.1. Pertinent clinical and socio-demographic characteristics.

The PMS was more likely to be associated with 19-20 years age group. It was more likely to be reported by females with earlier age of menarche (< 12 years of age), experiencing regular cycles and lower BMI (< 30). The PMS was more common among those having 3-7 days of

menstrual bleeding with less than average amount. However, there was no statistically significant association between PMS and family history of PMS. Less than half of the PMS group reported limited physical activity.

Table 3.2. Symptoms as per ACOG diagnostic criteria for premenstrual syndrome.

	Symptom PositiveTotal	PMS Cases	Non-PMS	Chi square value	P value ≤
	No (%)	No (%)	No (%)		
Abdominal bloating	96 (46.8)	68 (62.4)	28 (30.4)	0.841	0.359
Breast tenderness	104 (57.7)	77 (70.6)	27 (29.3)	0.244	0.621
Headache	55 (27.4)	43 (39.4)	12 (13)	41.19	0.000
Swelling of extremities	6 (2)	3 (2.8)	3 (3.3)	185.318	0.000
Confusion	37 (18.4)	27 (24.8)	10 (10.9)	80.244	0.000
Irritability	121 (60.2)	88 (80.7)	33 (35.9)	8.363	0.004
Social withdrawal	49 (23.9)	34 (31.2)	15 (16.3)	54.851	0.000
Angry outbursts	98 (48.8)	72 (66.1)	26 (28.3)	0.124	0.724
Anxiety	81 (39.8)	58 (53.2)	23 (25%)	8.0	0.005
Depression	91 (45.3)	63 (57.8)	28 (30.4)	1.796	0.180

The respondents reported experiencing both somatic and behavioural symptoms (Table 3.2). The most reported somatic symptoms included breast tenderness (70.6%), abdominal bloating (62.4%), headache (39.4%) and swelling of extremities (2.8%). The behavioural symptoms reported were irritability (80.7%), angry outburst (66.1%), depression

(57.8%), anxiety (53.2%), social withdrawal (31.2%) and confusion (24.8%). The prevalence of abdominal bloating, breast tenderness, angry outbursts and depression across the students with and without PMS did not reveal any significant difference. The symptoms of headache, confusion, irritability, social withdrawal, anxiety and swelling of extremities were

significantly associated with premenstrual syndrome.

Table 3.3. Impairment	of student's	physical and	mental d	activities in H	MS group.
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Limited daily activities		PMS Cases	Non-cases	Chi square value	P value ≤	
		No (%)	No (%)			
Concentration in class	Yes	40 (37.4%)	28 (30.4%)	1.062	0.202	
Concentration in class	No	67 (62.6%)	64 (69.6%)	1.002	0.303	
Uni attandanca	Yes	21 (19.8%)	20 (21.7%)	0.111	0.729	
Uni attendance	No	85 (80.2%)	72 (78.3%)	0.111	0.758	
Daily home shares	Yes	32 (29.9%)	18 (19.6%)	2.812	0.004	
Daily nome choices	No	75 (70.1%)	74 (80.4%)	2.812	0.094	
Homowork tooks	Yes	33 (30.8%)	20 (21.7%)	2.007	0.149	
Homework tasks	No	74 (69.2%)	72 (78.3%)	2.077	0.148	

The relationship between PMS and respondents' daily activities was shown in Table 3.3. The activities reported to be limited were concentration in class (37.4%), homework tasks (30.8%), daily home chores (29.9%) and college

attendance (19.8%). However, there was no statistically significant difference across the students with or without PMS.

Table 3.4	Regression	analysis	of variables	significantly	associated	with PMS
<i>Tuble 5.4.</i>	Regression	unuiysis (<i>y variables</i>	significantiy	ussociatea	with I MD.

Model		Unstandardized Coefficients		Standardized Coefficients	4	S:a	95.0% Confidence Interval for Beta	
		В	Std.Error	Beta	ι	Sig.	Lower Bound	Upper Bound
	(Constant)	.912	.322		2.829	.005	.276	1.548
	Higher Age Grp	065	.080	053	807	.421	223	.094
	Age at menarche	008	.065	008	121	.904	137	.121
	BMI	.022	.131	.011	.167	.868	236	.280
1	Regularity of menstruation	054	.074	047	725	.469	201	.093
	Anxiety	.105	.073	.103	1.438	.152	039	.250
	Irritability	.468	.068	.462	6.904	.000	.334	.602

Regression analysis of the variables that were significantly associated with PMS in the initial chi square test was done for all sets of predictors by category. All significant predictors were grouped in the final regression analyses presented in Table 3.4. It showed that PMS was significantly associated with irritability.

4. Discussions

In the present study, the prevalence of PMS was 51. 65% which was higher than those in other studies by Magdy Hassan Balaha et al and Serfatyet al [5] who reported prevalence of 35.6% and 35% respectively. Tabassum et al [6] and Nisaret al [7] also found that around 50% of college girls in Pakistan met with criteria of PMS. This difference might be due to variation in definitions, methods of data collection and type of study population.

While some studies found that PMS was increasing with age, others failed to report such correlation. Clecknedr-Smith et al [8] found that symptoms were more common in the 16-18 years age group compared to 13-15 years age group. The present study showed that the highest figures were in the 19-20 years old group which was in accordance with the finding by Bakhshani et al.[9] Urban residence was associated with increased PMS in this study but the association was not statistically significant. In the study by Shershah et al [10], the prevalence was 33% with the highest figures in lower socioeconomic group living in socially deprived areas. In our study, the incidence of PMS in girls with family history of PMS was 51.4% but it was not

statistically significant. The results of this study were not consistent with the findings of Nulufer Erbil et al.[4]

In the current study, there was a significant association between development of premenstrual syndrome and regular menstrual cycles and/or younger age of menarche. These findings were consistent with some previous investigators (Magdy Hassan Balaha et al and Abu- Hashem H et al. [5] On the contrary, H. Farrokh-Eslamlouet al [11] didn't find any association between PMS and age at menarche. Demir et al [12] reported a significant relationship between smoking habit and PMS. However, this relationship could not be assessed in the current study as all medical students in our study did not possess any smoking habit.

The most frequent somatic symptoms reported in the current study were breast tenderness (70.6%), abdominal bloating (62.4%). According to Thu et al [13], the most frequent symptoms reported by 266 female university students in Bangkok were breast discomfort and lower abdominal cramp. In the study by Magdy Hassan Balahaet al [5], the most frequently reported symptom was abdominal bloating (75.3%). However, Nadeeka K. Chandraratne [14] reported that the most common symptoms were fatigue and headache. This difference might be due to different cultural and socio-demographic background of respondents.

In the current study the most prevalent behavioural symptoms were irritability (80.7%), angry outburst (66.1%) and depression (57.8%), which were also reported in the study by Mortolaet al [15]. In addition, anxiety, confusion and social withdrawal were statistically more evident in the PMS group. Nulufer Erbil [4] reported that 10% of students

were diagnosed as having premenstrual dysphoric disorder (PMDD). In this study, there was no student to be diagnosed as PMDD according to DSM-IV criteria.

Magdy Hassan Balaha et al [5] found that 37% of students with PMS reported greater impairment of daily activities; concentration in class (48.3%), attending college (46%), going out of home (43.8%), daily home chores (42%) and homework tasks (36%). In contrast, students with PMS in this study reported less impairment of daily activities like concentration in class (37.4%), homework tasks (30.8%), daily home chores (29.9%) and college attendance (19.8%). And those were not statistically significant.

5. Conclusion

This study demonstrated that more than half of the female students had experienced PMS. PMS symptoms among the girls were headache, swelling of extremities, confusion, irritability, social withdrawal and anxiety. Of all the symptoms, PMS was significantly associated with irritability suggesting the potential problematic effect of PMS on psycho-social health of the students. The difference in limitation of daily activities among PMS group and Non-PMS group was insignificant. However, it was evident that the magnitude of PMS among female medical students was high with moderate sufferings. PMS awareness-raising among the vulnerable age group is recommended as appropriate recognition of symptoms would lead to early intervention eventually reducing human suffering,. It is to be highlighted that future research on PMS should be incorporated with follow-up and consultancy services so as to minimize the periodic suffering of the majority female population.

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