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ORIGINAL RESEARCH

Premenstrual Syndrome and Its Impact on the Quality of Life of Female Medical Students at Bisha University, Saudi Arabia

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Objective: The severity and chronicity of PMS can lead to the impairment of studies, and it can also affect relationships, activities, quality of life (QoL), and academic performance. This study aimed to determine PMS frequency and its associated factors in order to assess the quality of life (QoL) among female medical students at Bisha University, Saudi Arabia.

Methods: This study was cross-sectional and included 388 female medical students in the Faculty of Medical Applied Sciences and the Faculty of Medicine at Bisha University. The participants all filled in a self-administered questionnaire. The Premenstrual Syndrome Scale (PSS) was used based on the diagnostic and statistical criteria for PMS assessment. PMS was diagnosed after the presence of five or more severe premenstrual symptoms had been resolved following menstruation (adapted from American Psychiatric Association).

Data Analysis: The data obtained were analyzed using SPSS 25.0. A chi-square test was used to test the associations between the study variables. A logistic regression analysis technique was used to select the group of variables. Participants were asked to provide consent to participate in the study. IRB was obtained from the University of Bisha, College of Medicine.

Results: The participants were aged 19.5 ± 4.9 years, and the prevalence of PMS was 64.9%. Most of the female students were of extroverted personality types (35%). In addition, 13.4% were obese or overweight, and 19.5% of the 50% with PMS exercised regularly ($p < 0.05$). Menstruation significantly influenced the related quality of life subscales ($p < 0.05$).

Conclusion: PMS significantly influenced daily activities related to quality of life and homework. Moreover, almost half of the female students experienced the effects of menstruation in their learning environment. Therefore, among female students, the modification of risk factors should be considered a critical intervention point.

Keywords: PMS, medical students, quality of life, University of Bisha, Saudi Arabia

Introduction

Premenstrual syndrome (PMS) is a common gynecological disorder that usually presents with physical and behavioral symptoms that appear a few days before menstruation and disappear after menstruation.[1] Considerable morbidities associated with PMS have been reported to affect women's daily life and quality of life, and this is particularly true for female students.[2,3]

Students usually neglect the symptoms of PMS; therefore, PMS affects their quality of life (QoL) more than estimated and described. Healthcare providers should be aware of PMS during routine checkups.[4] Women's negative attitudes toward menstruation include irritability, anxiety, fatigue, and dysmenorrhea.[5]

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Menstrual-related depression has been reported as a significant morbidity among female university students.[6–8] Approximately 37.2% of female university students are at high or very high risk of a mental disorder.[8] According to the World Health Organization, 20–31% of university female students worldwide have at least one mental disorder associated with menstrual issues.[9,10]

PMS is associated with a lower positive academic affect and lower frontal rest asymmetry scores,[11] which are themselves related to reward processing dysfunction, lower productivity, and an interference with studies.[12–14] However, the latter point has been less frequently studied, specifically among Saudi female university students. This study aimed to determine PMS frequency and its associated factors in order to assess quality of life (QoL) among female medical students at Bisha University, Bisha, Saudi Arabia.

Methodology

- Design: This study was cross-sectional and examined PMS among female medical students in the Faculty of Medical Applied Sciences and the Faculty of Medicine at Bisha University.
- Setting: The University of Bisha is a newly established university that was created to serve the local population in the town of Bisha and its surrounding villages and small towns. There are three medical colleges for women and more than 850 students in the different programs.
- Study sampling and data collection: After providing informed consent, 388 female students participated in this study; their ages ranged from 18 to 25 years (mean of 19.5 ± 4.9 years).

The Raosoft program was used for sample size estimation. A questionnaire designed for a previous study[15] was used for data collection. The questionnaire included questions related to sociodemographic characteristics and personality types, as well as menstruation-related characteristics, use of medications, and the presence of PMS in family history. We also recorded some habits and medical characteristics (cigarette smoking, tea, coffee, drinks, sweets, cola, special food, obesity, and exercise). The recall bias was avoided by carefully selecting research questions, data collection method, and a prospective study design.

For evaluation, we used the Premenstrual Syndrome Scale (PSS) and the health-related quality of life (QoL) questionnaire. The Premenstrual Syndrome Scale (PSS) was used for the evaluation and diagnosis of PMS.[16] The diagnosis of PMS was based on the presence of five or more severe premenstrual symptoms that resolved following menstruation (adapted from the American Psychiatric Association).[17]

The health-related quality-of-life subscales in this study included: general well-being, interface with homework, satisfaction with research and career, control over studying, and stress from university study conditions. We examined the relationship between quality of life and the impact of menstruation on the study environment.

The data obtained were analyzed using SPSS 25.0. A chi-square test was used to test the associations between the study variables. In terms of ethical clearance, each participant enrolled in the study after providing informed consent. IRB was obtained from the University of Bisha, College of Medicine, ref no. UBCOM/H-06-BH087 (06/25).

Results

The prevalence of PMS among the studied population was 252/388 (64.9%). The factors that statistically significantly affected PMS were urban residency and being a non-smoker ($p < 0.05$). The details related to all significant and non-significant factors for all variables are available in Table 1.

Age at menarche ranged from 11 to 17 years, with a mean of 13.42 ± 1.25 years. The length of menstrual cycle ranged from 19 to 80 days, with a mean of 28.51 ± 4.83 days, while the duration of menstrual flow ranged from 2 to 11 days, with a mean of 6.12 ± 1.35 days. Dysmenorrhea was found in 53.6% of the female students. Of them, 39.2% had a family history of PMS (Table 2). The menstrual characteristics studied showed a statistically insignificant difference between the women with PMS and those without PMS ($p > 0.05$ for all variables; Table 2).

The symptoms reported to be statistically significantly associated with PMS were depressive affect and anxiety, fatigue and irritability, and bloating and painful or tender breasts ($p = 0.007$, 0.002, and 0.005, respectively). Other symptoms were also commonly reported, although the association with PMS was not statistically significant (Table 3).

Menstruation significantly affected the related quality of life subscales concerning the homework interface ($p < 0.05$). However, the most common effect of menstruation on the learning environment was stress in relation to reading (42.3%). Naturally, there were also

Table 1 Sociodemographic Characteristics. Evaluation of PMS and QoL Among Students of Medical Applied Sciences and Medicine at Bisha University, Saudi Arabia (n = 388)

Sociodemographic Characteristics		Premenstrual Syndrome		Total	*p*-value
		PMS	No PMS		
Residency	Rural	136 (80.9)	32 (19.1)	168 (21.6)	0.09
	Urban	184 (60.5)	120 (39.5)	304 (78.3)	
Where you stay	Student house	20 (5.2)	16 (4.1)	38 (9.3)	0.47
	With my family	92 (23.7)	52 (13.4)	144 (37.1)	
	House—apart	140 (36)	64 (17.5)	204 (53.6)	
Family income	Poor	12 (3.1)	8 (2.1)	20 (5.2)	0.97
	Average	232 (59.8)	124 (32)	356 (91.8)	
	High	8 (2.1)	4 (1.03)	12 (3.1)	
Mother's education	Primary or less	124 (32)	44 (11.3)	168 (43.3)	0.44
	Secondary	72 (18.6)	48 (12.3)	60 (31)	
	High school	52 (13.4)	40 (10.3)	52 (23.7)	
	College	4 (1)	4 (1)	8 (2)	
Father's education	Primary or less	96 (24.7)	32 (8.2)	128 (32.9)	0.45
	Secondary	60 (15.4)	32 (8.2)	92 (23.7)	
	High school	92 (23.7)	64 (17.5)	160 (41.2)	
	College	4 (1)	4 (1)	8 (2)	
Mother's employment	Employed	28 (7.2)	20 (5.2)	48 (12.4)	0.67
	Not employed	112 (57.7)	116 (29.8)	170 (87.6)	
Father's employment	Employed	84 (21.6)	60 (15.4)	144 (37.1)	0.30
	Not employed	168 (43.2)	76 (19.6)	244 (62.8)	
Personality type	Introverted	36 (9.2)	12 (3.1)	48 (12.3)	0.72
	Extraverted	92 (23.7)	44 (11.3)	136 (35)	
	Rationalistic	60 (15.5)	36 (9.3)	96 (24.8)	
	Aggressive–angry	8 (2.1)	12 (3.1)	20 (5.2)	
	Emotional	56 (14.4)	32 (8.2)	88 (22.6)	
Smoking	Non-smoker	252 (64.9)	136 (35)	288 (100)	0.07
	Smoker	0 (00)	0 (00)	0 (00)	
Obesity	Yes	32 (8.2)	20 (5.2)	52 (13.4)	0.5
	No	220 (56.7)	116 (29.8)	336 (86.6)	
Regular physical exercise	Yes	56 (14.4)	20 (5.1)	76 (19.5)	0.27
	No	196 (50.5)	116 (29.8)	312 (80.4)	

superordinate effects of menstruation (Table 4 and Figure 1).

Discussion

PMS disorder affects university women and influences their quality of life (QoL), academic performance, and social engagement. Therefore, studying this disorder among female students at Bisha University could help solve many of their educational and social problems related to academic performance.

With limited available data, this study addressed health determinants that influence academic performance and quality of life while studying. PMS among university students at Bisha Medical was found to be high (64.9%); however, prevalence was relatively low compared to 88.0% among Turkish university students.[18] The prevalence of PMS among female medical students at Bisha University is higher than that reported in Taiwan (39.5%),[19] Thailand (28–51%),[20] and Egypt (34%).[21] However, the most commonly reported

Table 2 Menstrual Characteristics. Evaluation of PMS and QoL Among Students of Medical Applied Sciences and Medicine at Bisha University, Saudi Arabia (n = 388)

Menstrual Characteristics		Premenstrual Syndrome		Total	*p*-value
		PMS	No PMS		
Age at menarche	<12 years	100 (25.7)	36 (9.2)	136 (35)	0.46
	13	84 (21.6)	48 (12.3)	132 (34)	
	14	48 (12.3)	36 (9.3)	84 (21.6)	
	≥15	20 (5.2)	16 (4.1)	36 (9.3)	
	<12 years	100 (25.7)	36 (9.3)	136 (35)	
Duration of menstrual cycle days	Short	4 (1)	16 (4.1)	20 (5.2)	0.32
	Normal	120 (30.9)	224 (57.7)	344 (88.6)	
	Long	12 (3.1)	8 (2.1)	20 (5.2)	
Duration of menstrual flow days	Short	12 (3.1)	12 (3.1)	24 (6.2)	0.44
	Normal	224 (57.7)	108 (27.8)	332 (85.5)	
	Long	16 (4.1)	16 (4.1)	32 (8.2)	
Use of drugs for menstrual regulation	Yes	16 (4.1)	24 (6.2)	40 (10.3)	0.07
	No	236 (60.8)	112 (28.8)	348 (89.6)	
Dysmenorrhea	Yes	152 (39.2)	56 (14.4)	208 (53.6)	0.09
	No	100 (25.7)	80(20.6)	180 (46.3)	
Family history	Yes	100 (25.7)	52 (13.4)	152 (39.2)	0.05
	No	152 (39.2)	84 (21.6)	236 (60.8)	

prevalence ranged from 20% to 30%.[9,10] At Bisha University, PMS prevalence was lower than at King Saud University (80.1%)[22] and King-Khalid and King Saud Universities (67.4%),[3] and higher than at King Abdulaziz University, Jeddah (60.9%).[23] Moreover, in Saudi universities, more than 98% of PMS sufferers practiced self-medication.[24] Although it is difficult to explain differences in PMS prevalence, they might possibly be due to the different social and ethnic backgrounds of the participants and our own sample limitations. Furthermore, there is no consensus in the research literature regarding how many symptoms must be present to warrant a PMS diagnosis.

This study found that PMS in these groups was associated with depressive affect, anxiety, fatigue, irritability, bloating, and painful or tender breasts. These factors were most likely related to the diagnosis of PMS and were recognized as alarming. Although these findings are inconsistent with those in international literature studies,[20,25,26] we suggest that the similarities may be due to the participants belonging to the same age group and being university students. The presence of alarming symptoms helps in planning educational sessions to prevent further consequences that might distress PMS.

This study showed that menstruation significantly affected academic performance and related quality of life ($p < 0.05$). Almost all participants were affected at different levels. The students experienced severe symptoms that affected their daily activities and negatively impacted their academic performance. Studies have reported that the severity of PMS prevents normal activities and significantly affects quality of life and academic performance.[25,27] However, the prevalence of PMS is difficult to determine in Bisha, because most students are from nearby villages and have varied access to healthcare. Therefore, it is important to design a project-based intervention that supports female students. In so doing, the university's administrative staff could consider the unique situation of female students and could help them academically and psychologically. However, the study is limited to the current research because of medical students. Therefore, without further evidence, the results or conclusions may not be representative of a larger population.

Conclusions

PMS was shown to significantly affect study-related quality of life and the homework interface. In addition, almost

Table 3 Symptoms Related to PMS. Evaluation of PMS and QoL Among Students of Medical Applied Sciences and Medicine at Bisha University, Saudi Arabia (n = 388)

Symptom Related to Menstruation		Premenstrual Syndrome		Total	*p*-value
		PMS	No PMS		
Depressive affect Anxiety	Yes	160 (41.2)	48 (12.3)	208 (53.6)	0.007
	No	52 (23.7)	88 (22.6)	180 (46.4)	
Fatigue Irritability	Yes	156 (40.2)	40 (10.3)	196 (50.5)	0.002
	No	96 (24.7)	96 (24.7)	192 (49.4)	
Depressive thought Pain	Yes	132 (34)	68 (17.5)	100 (51.5)	0.49
	No	120 (30.9)	68 (17.5)	188 (48.5)	
Appetite change Sleep change	Yes	128 (32.9)	48 (12.3)	176 (45.4)	0.10
	No	124 (31.9)	88 (22.6)	212 (54.6)	
Abdominal bloating Painful or tender breasts	Yes	132 (34)	32 (8.2)	164 (42.1)	0.005
	No	120 (30.9)	104 (26.8)	224 (57.7)	
Rapid mood changes Depressive affect	Yes	152 (39.1)	76 (19.5)	228 (58.8)	0.41
	No	100 (25.7)	60 (15.4)	160 (41.2)	
Anxiety Fatigue	Yes	164 (42.2)	64 (16.4)	228 (58.8)	0.06
	No	88 (22.6)	72 (18.5)	160(41.2)	
Irritability Depressive thought	Yes	148 (38.1)	60 (15.4)	208 (53.6)	0.12
	No	104 (26.8)	76 (19.5)	180 (46.4)	
Pain Appetite change	Yes	156 (40.2)	72 (18.5)	228 (58.8)	0.26
	No	98 (24.7)	64 (16.4)	160 (41.2)	
Sleep change	Yes	208 (53.6)	88 (22.6)	296 (76.3)	0.04
	No	44 (11.3)	48 (12.3)	92 (23.7)	

Table 4 Study-Related Quality of Life Subscales. Evaluation of PMS and QoL Among Students of Medical Applied Sciences and Medicine at Bisha University, Saudi Arabia (n = 388)

Study-Related Quality of Life Subscales	Effects of Menstruation on the Study Environment			Total	*p*-value
	Higher	Average	Lower		
General well-being	72 (18.6)	272 (70.1)	44 (11.3)	388 (100)	0.20
Homework interface	84 (21.6)	260 (67)	44 (11.3)	388 (100)	0.05
Study and career satisfaction	68 (17.5)	268 (69.1)	52 (13.4)	388 (100)	0.41
Control at study	56 (14.4)	272 (70.1)	60 (15.5)	388 (100)	0.90
Learning conditions	76 (19.6)	264 (68)	48 (12.4)	388 (100)	0.77
Stress at study	164 (42.3)	200 (51.5)	24 (6.2)	388 (100)	0.39

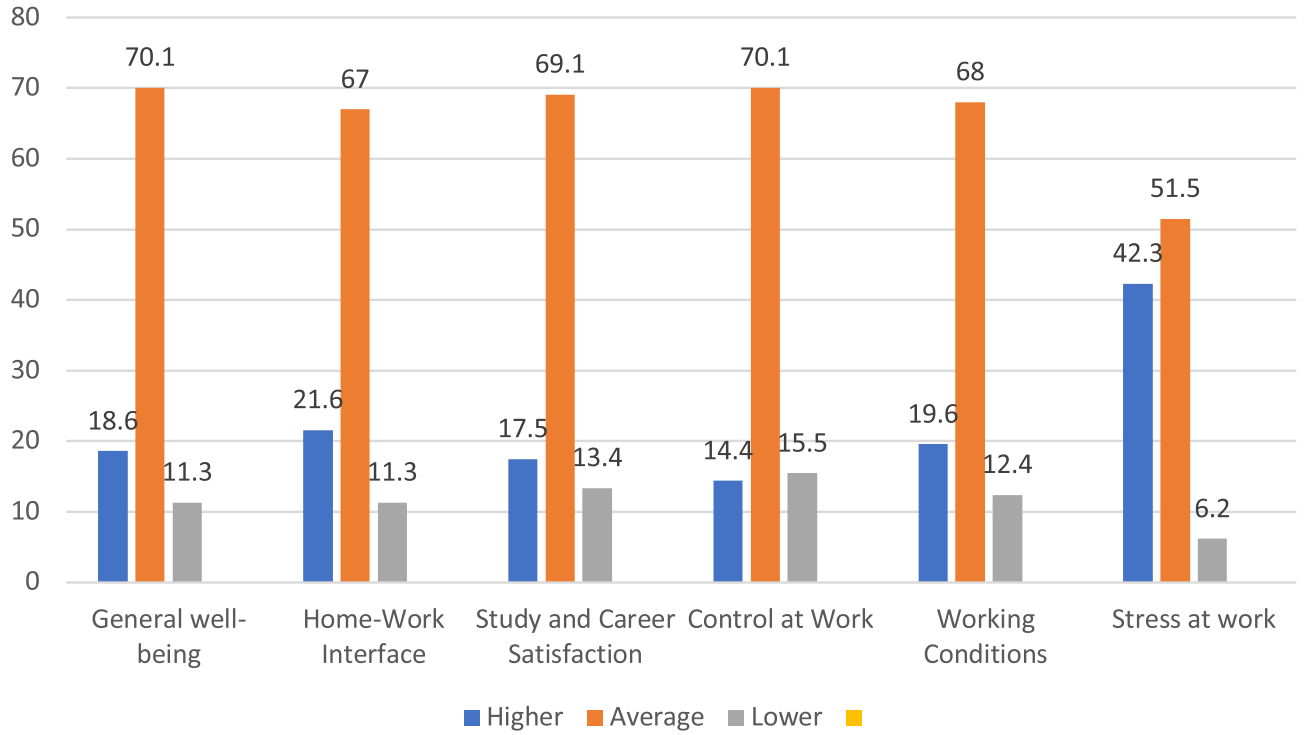

Figure 1 Learning-related QoL subscales by percentage among the study population. Evaluation of PMS and QoL among students of medical applied sciences and medicine at Bisha University, Saudi Arabia (n = 388).

half of the female students experienced the effects of menstruation in their learning environment. Therefore, for female students, modification of risk factors is an important intervention point.

Recommendations

The recommendations provided lead to the design of a project-based intervention to support female students. The University of Bisha could use a dedicated multidisciplinary support team, including nurses, gynecological staff, and psychiatric clinicians. Female students should also consider risk factor modifications. The university's administrative staff should also consider the particular situation of female students and should provide academic and psychological support for their specific needs.

Abbreviations

QoL, quality of life; PSS, Premenstrual Syndrome Scale; PMS, premenstrual syndrome.

Ethics Approval and Consent

This study was conducted in accordance with the Declaration of Helsinki. Institutional Review Board was obtained from the University of Bisha, College of Medicine, ref no. UBCOM/H-06-BH087 (06/25). Each participant enrolled in the study after providing informed consent.

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Author Contributions

All authors contributed to data analysis, drafting or revising the article, have agreed on the journal to which the article will be submitted, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare no conflict of interest.

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