RESEARCH ARTICLE

The effect of psychological stress on the menstrual cycle among medical students

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Abstract

Objective: To assess the prevalence of menstrual abnormalities among medical students, and to explore its association with stress levels.

Method: The cross-sectional study was conducted from May 18 to May 28, 2021, in Baghdad, Iraq, after approval from the ethics review committee of the College of Medicine, Mustansiriyah University, Baghdad, and comprised female medical students in Baghdad. Data was collected using simple random sampling technique and employed an online questionnaire that was distributed through e-mail. The questionnaire had 3 domains: demographic and anthropometric data, menstrual history, and psychological stress. The psychosocial stress levels was assessed using the Perceived Stress Scale-10. Data was analysed using SPSS 25.

Results: There were 397 subjects with mean age 20.84±1.621 years (range: 17-24 years). Mean age of menarche was 12.65±1.399 years, mean body mass index was 22.71±6.369kg/m^2 and the mean stress score was 22.71±6.016. Dysmenorrhoea was seen in 369(92.9%) cases, and premenstrual symptoms in 391(98.5%). Dysmenorrhoea, premenstrual syndrome and heavy bleeding were significantly associated with stress level ($p<0.05$).

Conclusion: Most students had heavy bleeding and dysmenorrhoea, which were severe enough to require analgesics. There was a significant association between high stress levels and the occurrence of menstrual abnormalities

Key Words: Dysmenorrhea, Menarche, Premenstrual, Stress, Psychological, Analgesics

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Introduction

The pursuit of success among medical students during their academic years creates high level of stress. Other reasons include heavy workload during exams, increased number of medical students that lowers the chances of future work opportunities, and the burden of their families' expectations. Such factors may affect the students physically as well, especially the females.[1]

Although menstrual cycle is a normal physiology, it may be embarrassing, and its disorders may cause further embarrassment requiring medical consultation, especially in the early period of menarche during which many disorders occur, such as dysmenorrhoea and menorrhagia.[2]

The disorders of menstrual cycle further impact medical students in the shape of absenteeism, missed classes and sometimes exams, reduced participation in sports and hobbies, besides causing disorders like premenstrual syndrome (PMS) which increases stress.[3]

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The stress factors, including frequent examinations, lead to sleeping disorders as well as to menstrual irregularity, dysmenorrhoea and PMS.[4]

The current study was planned to assess the prevalence of menstrual abnormalities among medical students, and to explore its association with stress levels.

Subjects and Methods

The cross-sectional study was conducted from May 18 to May 28, 2021, in Baghdad, Iraq, after approval from the ethics review committee of the College of Medicine, Mustansiriyah University, Baghdad. The sample was collected using simple random sampling technique and comprised female medical students in Baghdad. Those with chronic disease or psychiatric disease were excluded, and so were those using hormonal therapy.

After taking informed consent, data was collected using an online questionnaire that was distributed to medical college students through email. It was composed of 3 domains: anthropometric data, menstrual history, and psychosocial stress.

Demographic data included age and living conditions, while anthropometric data included weight and height on the basis of which body mass index (BMI) was

calculated. Menstrual data included average length of the menstrual cycle, which was counted from day 1 of menstrual flow till the day before the next menstrual flow, heavy menstrual flow, which was defined as bleeding for more than a week, number of sanitary pads required per day, passage of clots, occurrence of dysmenorrhoea, which was defined as acute spasmodic pain experienced in the lower abdomen that appeared on the first day of menses and rarely lasted >2 days and was severe enough to miss classes or any need to take medications such as analgesics, and any perception of PMS, which was defined as a collection of physical, emotional and behavioural symptoms that commenced before the menstrual flow in 2 weeks and remitted prior to it. Physical symptoms included abdominal pain, headache, nausea, increased frequency of stool, skin disorders, abdominal bloating, painful breasts, and swelling of extremities. Emotional symptoms included irritability, anger, depression and tension. Behavioural symptoms included increased or decreased food intake, hypersomnia, lethargy, and a marked lack of energy. Irregular menstrual cycles were defined as a past history of irregular cycles experienced by the students within 6 months prior to the study.[3]

The students' psychosocial stress level was assessed using the 10-item Perceived Stress Scale (PSS10), which is scored on a 5-point Likert scale, ranging from 0 -= never to 4 = very often in the preceding month. The scores were reversed for the 4 positive items (Nos. 4, 5, 7 and 8), but not for the remaining negative items. Total PSS10 score ranged 0-40, and >27 was classified as high stress.[4]

Data was analysed using SPSS 25. Data was expressed as frequencies and percentages and as mean ± standard deviation, as appropriate. Chi-square test was used to assess the association between study variables. P<0.05 was considered statistically significant.

Results

There were 397 subjects with mean age 20.84±1.621 years (range: 17-24 years). Mean age of menarche was 12.65±1.399 years, mean BMI was 22.71±6.369kg/m^2 and the mean PSS10 score was 22.71±6.016 (Table 1).

PMS was reported by 391(98.5%) subjects and dysmenorrhoea by 369(92.9%). A total of 152(38.3%) subjects experienced irregular cycles and 217(54.7%) reported heavy bleeding. Prolonged cycles were reported by 4(1%) subjects. Classes were missed by 85(21.4 %) subjects because of dysmenorrhoea, and 283(71.3%) had to take medication, such as analgesics.

Table-1: Demographic characteristics (n=397).

Characteristics	(mean ± SD)
Age (years)	20.84 ± 1.621
BMI	22.71 ± 6.369
Age of menarche (years)	12.65 ± 1.399
PSS score	22.71 ± 6.016

Table-2: Menstrual abnormalities.

Menstrual Abnormality		Frequency	Percentage
Dysmenorrhoea	Yes	369	92.9
	No	28	7.1
Irregular cycle	Yes	152	38.3
	No	245	61.7
Heavy bleeding	Yes	217	54.7
	No	180	45.3
Prolonged cycles	Yes	4	1.0
	No	393	99.0
Premenstrual symptoms	Yes	391	98.5
	No	6	1.5
Dysmenorrhoea severe enough for medication	Yes	283	71.3
	No	114	28.7
Dysmenorrhoea severe enough to miss classes	Yes	85	21.4
	No	312	78.6

Table-3: The association of demographic and menstrual factors with perceived stress.

Characteristic	High stress		Low stress		p value
	Count	%	Count	%	
Age					
20 years	47	30.9	105	69.1	0.075
20 years	56	22.9	189	77.1	
Body Mass Index (BMI)					
Underweight	14	33.3	28	66.7	0.543
Normal weight	68	25.3	201	74.7	
Overweight	18	23.1	60	76.9	
Obese	3	37.5	5	62.5	
Living condition					
With family	95	27.1	256	72.9	0.318
Dormitories	3	13.6	19	86.4	
With friends	5	20.8	19	79.2	
Irregular cycle					
Yes	45	29.6	107	70.4	0.190
No	58	23.7	187	76.3	
Heavy bleeding					
Yes	70	32.3	147	67.7	0.002
No	33	18.3	147	81.7	
Premenstrual syndrome					
Yes	98	25	293	74.9	0.001231
No	5	83.3	1	16.6	
Dysmenorrhea severe enough for medication					
Yes	76	26.9	207	73.1	0.514
No	27	23.7	87	76.3	
Dysmenorrhea severe enough to miss classes					
Yes	29	34.1	56	65.9	0.027
No	70	22.4	242	77.6	

Dysmenorrhoea, PMS and heavy bleeding were significantly associated with stress level ($p<0.05$) (Table 3).

Discussion

The current study explored the prevalence of menstrual abnormalities among medical students, and its association with stress. Such studies have been done in many countries, unlike Iraq where the relevant data is scarce[5-7].

The age of menarche among the current subjects ranged 9-16 years, with a mean age of 12.65±1.621 years, which is comparable with other reports[8,9]. Premenstrual symptoms occurred in 98.5% subjects and dysmenorrhoea in 92.9% which were the most common menstrual abnormalities in the current study, similar to the studies done by Singh et al[10]. The prevalence of dysmenorrhoea was relatively high (92.9%) in the current sample, which was comparable to studies done in Nigeria, Egypt, Saudi Arabia and Oman[11-15]. On the other hand, some studies reported lower values[16-19].

A study in Saudi Arabia reported that 18.3% of the students perceived severe stress levels, which was approximately similar to the current findings[20].

Of the students who reported dysmenorrhoea in the current study, 21.4% had it severe enough to make them miss classes, and 71.3% were using medications to control it. A study in India found that only 37.5% were using medications among medical students[4]. The proportion of students using medications in the current study was high compared to those missing classes. This could be due to the fact that non-steroidal anti-inflammatory drugs (NSAIDs) ate over-the-counter (OTC) drug, and students have a proclivity for self-medication[21].

Mean PSS10 score was 22.71 in the current study, and it was associated with premenstrual symptoms. The results are I line with studies showing that psychosocial stress in daily life influences the occurrence of heavy bleeding and dysmenorrhoea severe enough to miss classes.[4]

Wang et al. suggested that perceived stress was associated with dysmenorrhoea. In the current study, students who had dysmenorrhoea severe enough to miss classes had a significantly higher mean PSS score.[22]

Concerning reasons for absenteeism from the study, (24.4%) of the respondents confirmed having very painful periods, hindering them from attending class. Such findings were parallel to those of an earlier study in which absenteeism due to dysmenorrhoea was seen among 23.6% girls.[23]

Limitation: The current study has limitations as the sample size was not calculated, which could have affected the power of the study.

Conclusion

Most students had premenstrual symptoms, heavy bleeding and dysmenorrhoea, which were severe enough to require analgesics. There was a significant association between high stress levels and the occurrence of menstrual abnormalities.

Disclaimer: None.

Conflict of Interest: None.

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