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FACTORS AFFECTING MENSTRUAL CYCLE PATTERNS AMONG MEDICAL STUDENTS OF AIMC

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Abstract:

Objectives:

To assess the factors affecting menstrual pattern in students of AIMC. To establish an association between menstrual health and factors like BMI, perceived stress, junk food, exercise, and circadian rhythm.

Study Design: *Descriptive cross-sectional study.*

Place and Duration: *Allama Iqbal Medical College. Feb-April, 2019*

Methodology: *A total of 250 female students participated in the study by completing the questionnaire which dealt with lifestyle, menstrual history and menstrual health status. Data was analyzed using SPSS version 21.0.*

Results:

The study revealed that out of total 250 participants, 179(76%) had regular menstrual cycle while 71(28.4%) had irregularity in their menses. Incidence of menstrual irregularity was higher in junk food consumers and individuals having high stress scores, whereas exercise, BMI, and circadian rhythm did not show any significant association with irregularity.

Conclusion: *Despite being in a medical profession, the students were unaware of the facts that stress and high junk food consumption can lead to deviation from normal menstrual cycle which could lead to further various abnormalities like polycystic ovarian disease, obesity and infertility.*

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INTRODUCTION:

Menstruation is a physiological phenomenon characterized by regular discharge of blood and mucosa from uterus, through vagina, periodically[1,2]. Estrogen and progesterone are regulators of cycle along with FSH and LH[3].

Females' first menstruation is menarche, normally occurs between 11 and 14 years of age[4]. Normal cycle length among young females is 21 to 45 days with periodic bleeding from 3 to 7 days with average blood loss of 35 to 80ml[1].

Population based studies have indicated that large proportion of female population of reproductive age suffers from menstruation related health issues[1]. Menstrual irregularities include primary amenorrhea, secondary amenorrhea, dysmenorrhea, oligomenorrhea, hypomenorrhea, hypermenorrhea and premenstrual syndrome. Prevalence of primary dysmenorrhea decreases with increasing age and is highest in 20 to 24 years of age group[5].Irregular menstrual cycle may be linked to premenstrual symptoms and menstrual pain through the pathway of hormones i.e. estrogen and progesterone. Serious health outcomes such as Type 2 Diabetes, Cardiovascular diseases, Osteoporosis, Infertility and Increased risk of breast cancer are associated with prolonged irregularities[6].

Menstrual patterns can be affected by a number of factors such as stress, BMI, smoking, nutritional imbalance, anemia social isolation, disturbed circadian rhythm, physical activities, drugs, alcohol consumption and genetic factors[3,7].

Objectives:

The aim of this study was to assess various factors affecting menstrual cycle pattern. To determine the association between perceived stress, BMI, anemia and circadian rhythm and Menstrual irregularity. The study results will be helpful for creating strategies for improving psychological and reproductive health of young females.

Operational Definiton

Menstrual cycle is normal physiological cycle in females which plays a pivitol role in their reproductive life.Present study is based on factors affecting menstrual cycle.

MATERIAL AND METHODS:

Study Design: Cross sectional study

Study Setting: Allama Iqbal Medical College, Lahore.

Duration of Study: Feb-April, 2019.

Sample Size: Sample size estimated from epi-info to estimate a proportion
Confidence level = 95%
Acceptable difference = 0.05%
Assumed proportion = 0.05%
Required Sample Size = 250

Sampling Technique: Non probability / purposive sampling

Sampling Technique : All female students of 3rd and 4th year MBBS.

Data Collection Procedure: 250 subjects those fulfilling the inclusion criteria were recruited for the study. After an informed consent a performa was given and all information was entered in that performa.

Data Analysis Procedure: Data was entered and analyzed in SPSS version 21. Frequency tables and percentages are generated for variables. The cross tabulation was done for variables of interest.

RESULTS:

A total of 250 girls participated in the study aged between 17 to 24yrs. Table 1 and 2 shows the background characteristics and cumulative percentages of factors studied in sample. The reported age of menarche was below 12yrs of 28% of students and above 12yrs of 72% of students. Out of 250 participants 179(76%) had regular menstrual cycle, while 71(28.4%) had irregular menstrual cycle.Table 2 and 7 shows that the tendency of irregular cycles was more in students having high stress scores and those those consuming more junk food. With regard to stress, our study showed that high level of perceived stress was associated with high probability of menstrual cycle irregularity.The study identified a higher incidence i.e 39% in stressed studends as compared to non stressed students in which incidence is 9%. An important finding of present study was that students stated that they had missed periods during time of high stress, and irregularity was also more during that duration. Table 7 shows the strong correlation between junk food consumption and menstrual irregularity highlighting that tendency of irregularity increased down the table as the consumption of junk food increased in days per week. Moreover, the relationship between BMI, Hb levels, ecercise,circaidian rhythms and menstrual cyle was not found significant in our study.

FINDINGS

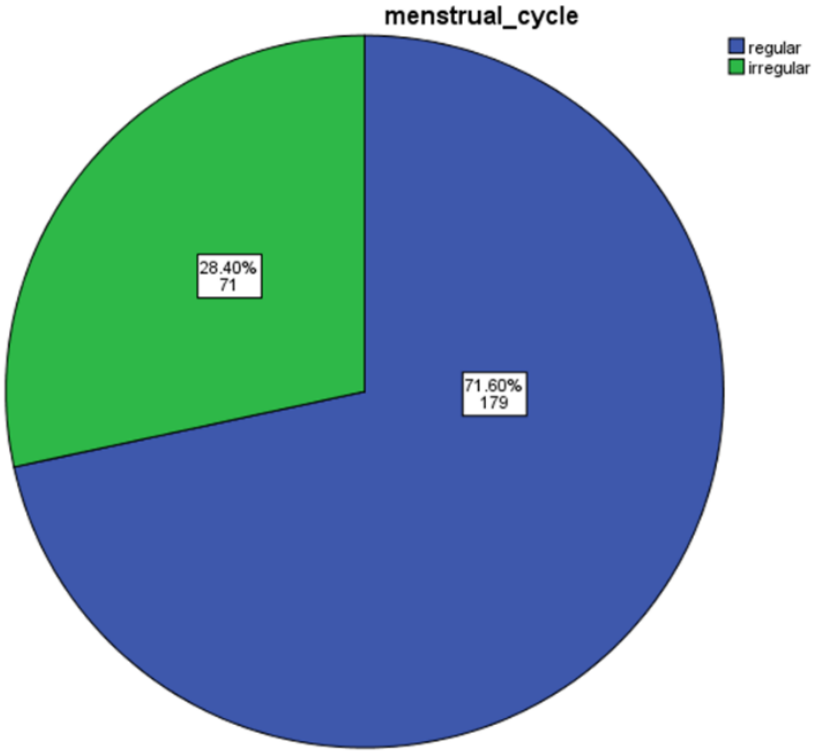
Table 1. Various menstrual patterns of 250 medical students.

		Count	Column N %
age_of_menarche	below12	70	28.0%
	above 12	180	72.0%
menstrual_cycle	Regular	179	71.6%
	Irregular	71	28.4%
cycle_length	less than 21	53	21.2%
	21 to 45	187	74.8%
	greater than 45	10	4.0%
menstrual_flow	Little	16	6.4%
	Moderate	224	89.6%
	Heavy	10	4.0%
Duration	less than 2 days	10	4.0%
	3 to7 days	231	92.4%
	greater than 8 days	9	3.6%
premenstrual_symptoms	Pain	137	54.8%
	mood swings	94	37.6%
	breast tenderness	19	7.6%

Table 2. Factors under study.

BMI	less	23	9.2%
	Normal	194	77.6%
	Greater	33	13.2%
Junk Food	0 days per week	16	6.4%
	1 day per week	107	42.8%
	2-3 days per week	97	38.8%
	4 -7 days per week	30	12.0%
Exercise	0 days per week	83	33.2%
	1 day per week	52	20.8%
	2-3 days per week	59	23.6%
	4-7 days per week	56	22.4%
Hb_levels	below 9	9	3.6%
	9-11	189	75.6%
	above 12	52	20.8%
Circaidian_rhythms	scheduled	135	54.0%
	unscheduled	115	46.0%
Stress_Relation	Yes	159	63.6%
	No	91	36.4%
PSS	Low	30	12.0%
	Moderate	145	58.0%
	High	75	30.0%

Table 3. Association of stress and menstrual cycle



Crosstab

			menstrual_cycle		
			regular	irregular	Total
stress_relation	yes	Count	97	62	159
		% within stress_relation	61.0%	39.0%	100.0%
	no	Count	82	9	91
		% within stress_relation	90.1%	9.9%	100.0%
Total		Count	179	71	250
		% within stress_relation	71.6%	28.4%	100.0%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	24.108[a]	1	.000		

Table 4. Association between PSS scale and menstrual cycle

Crosstab

			menstrual_cycle		
			regular	irregular	Total
pss	low	Count	24	6	30
		% within pss	80.0%	20.0%	100.0%
	moderate	Count	106	39	145
		% within pss	73.1%	26.9%	100.0%
	high	Count	49	26	75
		% within pss	65.3%	34.7%	100.0%
Total		Count	179	71	250
		% within pss	71.6%	28.4%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.651[a]	2	.266

Table 5. Association of exercise and menstrual cycle

Crosstab

			menstrual_cycle		
			regular	irregular	Total
exercise	0 days per week	Count	61	22	83
		% within exercise	73.5%	26.5%	100.0%
	1 day per week	Count	39	13	52
		% within exercise	75.0%	25.0%	100.0%
	2-3 days per week	Count	41	18	59
		% within exercise	69.5%	30.5%	100.0%
	4-7 days per week	Count	38	18	56
		% within exercise	67.9%	32.1%	100.0%
Total		Count	179	71	250
		% within exercise	71.6%	28.4%	100.0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.957[a]	3	.812

Table 6. Association of BMI and menstrual cycle

Crosstab

			menstrual_cycle		Total
			regular	irregular	
bmi	less	Count	18	5	23
		% within bmi	78.3%	21.7%	100.0%
	normal	Count	139	55	194
		% within bmi	71.6%	28.4%	100.0%
	greater	Count	22	11	33
		% within bmi	66.7%	33.3%	100.0%
Total		Count	179	71	250
		% within bmi	71.6%	28.4%	100.0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.897[a]	2	.639

Table 7. Association of junk food with menstrual cycle.

Crosstab

			menstrual_cycle		Total
			regular	irregular	
junk_food	0 days per week	Count	10	6	16
		% within junk_food	62.5%	37.5%	100.0%
	1 day per week	Count	87	20	107
		% within junk_food	81.3%	18.7%	100.0%
	2-3 days per week	Count	66	31	97
		% within junk_food	68.0%	32.0%	100.0%
	4 -7 days per week	Count	16	14	30
		% within junk_food	53.3%	46.7%	100.0%
Total		Count	179	71	250
		% within junk_food	71.6%	28.4%	100.0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.138[a]	3	.011

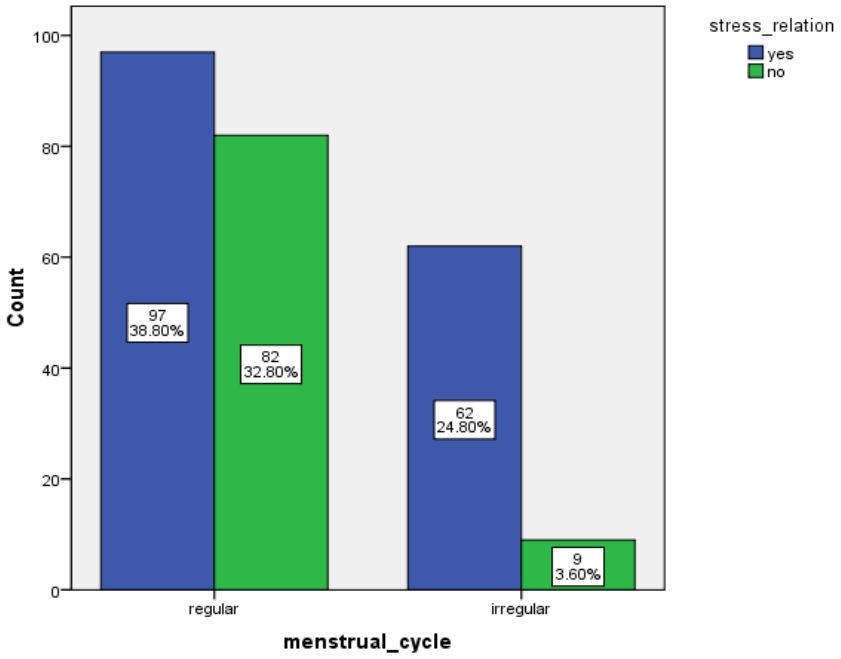
Table 8. Association of circadian rhythms with menstrual cycle.

Crosstab

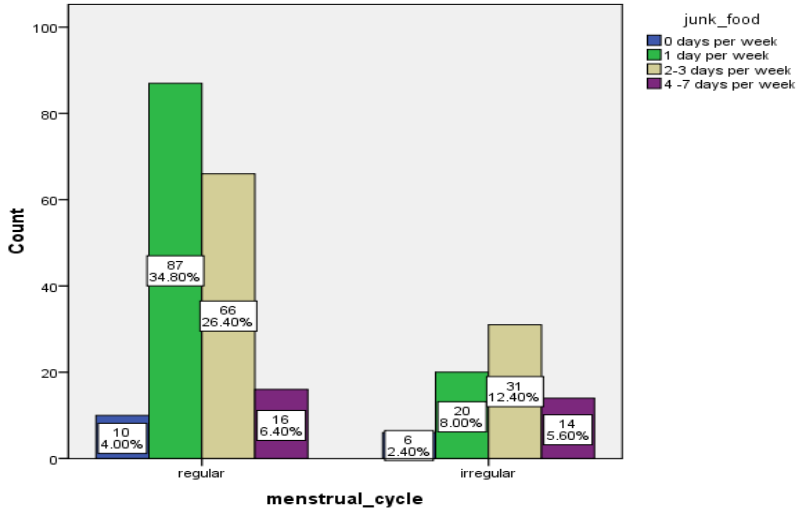
			menstrual_cycle		
			regular	irregular	Total
circaidian_rhythms	scheduled	Count	100	35	135
		% within circaidian_rhythms	74.1%	25.9%	100.0%
	unscheduled	Count	79	36	115
		% within circaidian_rhythms	68.7%	31.3%	100.0%
Total		Count	179	71	250
		% within circaidian_rhythms	71.6%	28.4%	100.0%

Chi-Square Tests					
	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.883[a]	1	.347		

Graph 1: Relationship between stress and menstrual irregularity.



Graph 2. Relationship between junk food consumption and menstrual irregularity.



DISCUSSION:

Menstrual problems and stress are among the most common health problems in young females studying health sciences [1]. Table 1 shows the details of menstrual patterns of participants, including cycle length, quantity of blood loss, and duration of flow in days and premenstrual symptoms.

The study investigated the various factors influencing the menstrual cycle. In present study factors for menstrual irregularity were BMI, perceived stress, junk food consumption, physical activity(exercise), circadian rhythms and status of anemia.

The study showed that there was significant association between perceived stress and menstrual irregularity via Chi sq. test(table3). Previous studies also revealed that menstrual cycle irregularity was associated with high chronic stress level [1,2,7,16]. Moreover, past studies have utilized various tool to check stress levels that are PSS and global severity index. In study, we used the former one. Theoretically, mechanism through which stress effects the menstrual cycle is prolonged activation of hypothalamic pituitary adrenal axis by stress which may later alter hormonal profiles resulting in disruption of normal ovulation [1,7,12].

In present study, 69% students had raised stress levels out of which 39% had irregularity in their

menstrual cycle. 36% had normal stress levels out of which only 9% showed irregularity. A number of stressors were present like educational, academic and emotional stress, according to students. These findings are consistent with previous studies on stress and associated menstrual disorders[1,2,6,12].
Another factor considered in present study was junk food consumption. The record of junk food consumption showed that alarmingly 92% of students liked to have junk food. Out of which, 42% consumed junk food 1 day per week, 38% consumed 2_3 days per week, and12% consumed 4_7 days per week. The study revealed that probability of irregularity was increased with increase in junk food consumption (Table 7). Out of total consumers, 28.4% had irregular cycles while 71.6% had irregularity in cycles.

The association between menstrual irregularity and junk food consumption was also reported in earlier studies [12]. Junk food being rich in fatty acids might interfere with metabolism of progesterone. Frequency of consumption of junk food concomitantly with less physical activity with added stress, predispose to menstrual disorders.

Present study concluded that BMI was independently associated with irregular menstrual cycle . that was coherent with a previous study [5,6]. However, in most of previous studies above or below the normal range has been associated with irregular menstrual cycles [8,7,12].

In present study, out of 56 students with abnormal BMI only17 students experienced irregular cycle (Table 6), so a positive association could not be established between the two, as some of authors have also reported no significant correlation [5,12].

It was observed in present study that physical physical exercise was not a significant predictor of menstrual cycle pattern (Table 5). Unexpectedly, this was not coherent with other researches done in past [12]. It can might be due to study limitations.

In present study, a new factor of circadian rhythms was added that may influence menstrual cycle. It was expected that students with unscheduled sleep-wake cycle might have menstrual irregularity due to hormonal imbalance, as hypothalamus controls both the sleep-wake cycle and menstrual cycle, but the study revealed no significant association between menstrual cycle and circadian rhythms.

LIMITATIONS

The study was cross-sectional in design based on structured questionnaire on a sample size of 250. The self-reported information about menstrual cycle can be influenced by subjective bias as students considered it a very private information and stigmatized those having irregular cycle, so they hesitated to give true information. Moreover, majority of the students were unaware of factors so they did not keep record of influence of any factor and their date of menstruation.

CONCLUSIONS:

Our study results showed the importance of healthier behavioral practices to maintain menstrual cycle irregularity especially while considering that stress and high junk food consumption could lead to deviations from normalcy as menstruation is a normal physiological process and its abnormalities can cause severe health problems like polycystic ovarian disease, hyperlipidemia, obesity, infertility, low self-esteem and absenteeism.

RECOMMENDATIONS

It is recommended that all medical students should be provided with short courses on stress management techniques.
Seminars must be arranged to give awareness on menstrual health and factors affecting its normalcy, and any abnormality should not be stigmatized.
Lifestyle modifications like regular physical activities, diminishing the intake of junk food and promoting healthy eating habits should be accentuated to improve menstrual health.

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QUESTIONNAIRE

Factors Affecting Menstrual Pattern Among Female Medical Students of AIMC

NAME: AGE:

RESIDENCE: Hostellite/ Day scholar

Socioeconomic status: Low/ Middle / High

A Kindly give your relevant data.

PART: 1

Age of Menarche:

Menstrual cycle :

- Regular
- Irregular

Cycle length:

- < 21 days
- 21-45 days
- >45 days

Amount of menstrual flow:

- Little
- Moderate
- Heavy

Duration of menstrual flow:

- < 2 days
- 3 – 7 days
- > 8 days

Do you experience any discomfort before menses which remits after menses (can choose more than 1)?

- Pain
- Mode swings
- Breast tenderness

Your Height and weight:_____ BMI: _____

Frequency of consumption of junk food (Days/week):

- 0 day/week
- 1 day/week
- 2- 3 days/week
- 4-7 days/ week

Frequency of exercise or walk of 30 min (days/week)

- 0 day/week
- 1 day/ week
- 2-3 days/week
- 4-7 days/ week

Your Hb levels:

- Below 9
- 9-11 gm/ dl
- Above 12 gm/dl

Do you have a scheduled sleep wake cycle:

- Yes
- No

Do you think stress affects your menstrual cycle pattern:

- Yes
- No

Do you miss periods when you are stressed

- Yes
- No

Any factor that you consider as causing disturbance in your regular cycle. _____

PART: 2

For each of following, choose from following alternatives:

0 – never 1- almost never 2- sometimes 3 – fairly often 4 – very often

- In last month, how often you have been upset of something that happened unexpectedly.
- In last month, how often you have felt that you were unable to control important things in your life.
- In last month, how often you have felt nervous and stressed.
- In last month, how often you have felt confident about your ability to handle your personal problem.
- In last month, how often you have found that things were going out your way
- In last month, how often you have found that you could not cope with all the things you had to-do.
- In last month, how often you have been able to control irritations in your life.
- In last month , how often you have felt that you were on the top of things.
- In last month, how often you have been angered because of things that happened were outside of your control.
- In last month ,how often you felt that difficulties were pilling so high that you could not overcome them.