Original Article

Effects of Sociodemographic Factors on the Pattern of Menstrual Cycle

Kousar Fatima[1], Farhana Anjum[2], Ambreen Amna Siddique[3], Raana Mazhar[4], Sehrish Khan[5], Sadya Iram[6]

[1]Assistant Professor of Obs & Gynae, Suleman Roshan Medical College Tando Adam, Sindh
[2]Professor of Obs & Gynae, Isra University Hospital Hyderabad, [3]Associate Professor of Obs & Gynae, Isra University Hospital Hyderabad
[4]Chief Consultant Gynaecologist, Lady Aitchison Hospital (KEMU) Lahore
[5]Consultant Gynaecologist, LUMHS, Civil Hospital Hyderabad, [6]WMO, Department of Obs & Gynae, LUMHS, Civil Hospital Hyderabad

Correspondence: Dr Kousar Fatima
Assistant Professor of Obs & Gynae,
Suleman Roshan Medical College Tando Adam, Sindh
Email: kousar.memon@gmail.com

Abstract

Objective: To evaluate of the effects of age of menarche, BMI, physical activity on the length and regularity of menstruation cycle.
Methodology: This cross-sectional study was done at gynae and OBS department of Isra University Hospital, Hyderabad. All female students of Isra University Hospital regardless of their year of graduation or post-graduation who agreed for giving their past personal history related to menstrual pattern between the ages of 17-32 years were included. Subjects were evaluated for their age on the basis of date of birth written on their registration forms of the University, BMI by measuring height in standing position and weight in kilograms, age of menarche from their past personal history and activity perform per day on proforma and analyzed by employing SPSS-26.0.
Results: The mean length of menstrual cycle was 26.4±3.12 days. Out of 185 girls, 52 (28.1%) has reported the length of their menstrual cycle <25 days, 19 (10.3%) had a long menstrual cycle pattern >30 days and 114 (61.6%) girls had normal (26-29 days) menstrual cycle pattern for last six months. Menstrual cycle pattern was statistically insignificant according to age and BMI (p=>0.05), while it was statistically significant according to age of menarche and physical activity (p = <0.05).
Conclusion: The study's findings indicate a concerning prevalence of irregular menstrual cycles among medical university students. This information is eye-opening because irregular menstrual cycles can be a sign of underlying health issues and can impact a person's reproductive and overall health.
Keywords: Menstrual cycle, menarche, demographic factors

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Introduction

The pattern of the menstrual cycle plays a vital role in the reproductive health of young people, and when it is irregular, it can pose a threat to their physical and mental well-being.[1] However, it may be possible to modify this irregularity.[1,2] In addition, long and irregular menstrual cycles have been linked to premature mortality.[1,3] A normal menstruation cycle seems to be an essential assumption of a healthy reproductive mechanism. Menarche, the onset of menstruation in healthy women, typically occurs between the ages of 10 and 16 and involves a regular cycle of 28 days with bleeding lasting 4-6 days.[4] However, several commonest minor alterations such as Oligomenorrhoea, menorrhagia, amenorrhea, menorrhagia, polymenorrhoea and Hypomenorrhea can occur, and these menstrual disorders can significantly impact the quality of life for young women.[4] Some research studies have identified several risk factors associated with severe dysmenorrhea episodes.[5] These factors may comprise smoking, experiencing menarche at an earlier age, having a positive family history of dysmenorrhea, extended menstrual periods, obesity, and consuming alcohol.[5,6] In addition, depression and stress have been found to elevate the likelihood of experiencing dysmenorrhea.[5,7] Female students encounter various issues that negatively impact their quality of life and academic performance. Among these issues, irregular menstrual cycles are a significant gynecological problem that causes anxiety not only to the students themselves

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but also to their families.[8,9] It affects their ability to carry out daily activities. Additionally, research studies have shown that menstrual irregularity can have long-term consequences on future health, including infertility, diabetes mellitus and osteoporosis.[8,10] Several studies conducted globally have demonstrated that socio-demographic factors, including the type of family, maternal education level, religion, socioeconomic status and menstrual hygiene practices are significant determinants of menstrual hygiene practices among teenage girls.[11] However the focus of this study was to assess the age of menarche, BMI, and physical activity impact the regularity and length of the menstrual cycle. The findings of this study could be utilized to develop awareness programs that encourage menstrual cycle self-assessment, regular exercise, and nutritional evaluation to improve menstrual health among women.

Methodology

This cross-sectional study was done at Gynae and OBS department, Isra University Hospital, Hyderabad. Study duration was six months from September 2018 to March 2019. Non probability consecutive sampling technique was used. All female students of Isra University Hospital who are agreed for giving their past personal history related to menstrual pattern, between the ages of 17-32 years were included in this study. Girls with chronic disorders like tuberculosis, hepatitis and hemorrhoids, thalassemia and type I diabetes and any malignancy and pregnant female were excluded. Permission was taken from ethical committee of Isra University. The female students were briefed about the purpose and procedure of the study and written informed consent was taken from the students. The females were evaluated by the trainee researcher herself for their age on the basis of date of birth written on their registration forms of the University, BMI by measuring height in standing position and weight in kilograms, age of menarche from their past personal history and activity perform. The menstrual pattern was evaluated by history of last six months is defined as normal (26-29) days, irregular pattern as short (25<) days and long (30>) days. The information was documented on Performa. Statistical package for social science (SPSS-26.0) was used to analyze data. Frequency and percentage were computed for categorical variables like menstrual cycle and physical activity. Mean and standard deviation were computed for continuous data variables like age, BMI and age of menarche. Stratification with respect to age, BMI, physical activity and age of menarche was done to evaluate the effect of these variables on menstrual pattern.

Results

The mean age of participants was 22.3±3.18 (ranging from 17 to 32) years. The mean age of menarche was 13.1±1.63 (ranging from 11 to 18 years). The mean BMI was 23.6±4.5 kg/m^2. Majority of the girls (55.1%) were fulfilling physical activity criteria, while (44.9%) not. The mean length of menstrual cycle was 26.4±3.12 days. Table I

Table I: Demographic and clinical pattern of the study participants (n=185)

Variables		Statistics
Age (mean ±SD)		22.3±3.18 years
Age of menarche (mean ±SD)		13.1±1.63 years
BMI (mean ±SD)		23.6±4.5 kg/ m^2
Length of menstrual cycle (mean ±SD)		26.4±3.12 days
Physical activity	Yes	55.1%
	No	44.9%

In accordance to menstrual cycle pattern, 28.10% girls had short menstrual cycle pattern, 10.30% girls had long menstrual cycle pattern, while 61.60% girls had normal menstrual cycle pattern. Figure 1

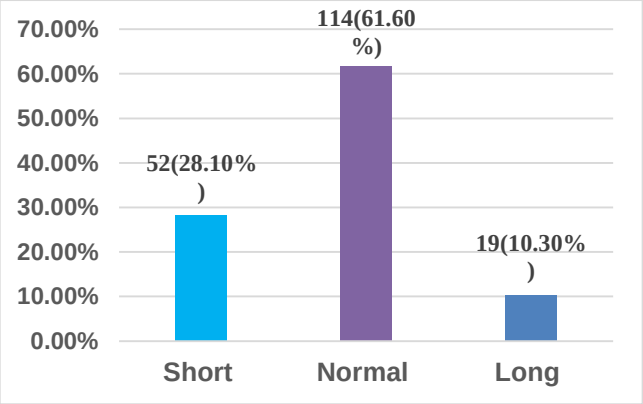

Figure 1. Menstrual cycle pattern (n=185)

Menstrual cycle pattern was statistically insignificant according to age and BMI (p=>0.05), while it was statistically significant according to age of menarche and physical activity (p = <0.05). Table II

Discussion

The menstrual cycle is a crucial biological process in the reproductive life of women. Various factors can influence the pattern of menstrual cycles. The age of menarche can be influenced by various factors, including genetics, nutrition, and environmental factors. In addition, several factors can affect the length and regularity of the

Table II: Menstrual cycle pattern according to age, age of menarche, BMI and physical activity (n = 185)

Sociodemographic factors		MENSTRUAL CYCLE PATTERN			p-value
		Short	Normal	Long	
Age groups	< 20 years	9 (42.9%)	9 (42.9%)	3 (14.3%)	0.612
	20-24 years	32 (25.6%)	81 (64.8%)	12 (9.6%)	
	25-29 years	8 (29.6%)	17 (63.0%)	2 (7.4%)	
	>29 years	3 (25.0%)	7 (58.3%)	2 (16.7%)	
Age of menarche	11-12 years	12 (29.3)	26 (63.4)	3 (7.3)	0.010
	13-14 years	37 (34.3)	57 (52.8)	14 (13.0)	
	15-16 years	2 (6.3)	28 (87.5)	2 (6.3)	
	17-18 years	1 (25.0)	3 (75.0)	--	
BMI	< 20 kg/m^2	4 (19.0)	12 (57.1)	5 (23.8)	0.156
	20-25 kg/m^2	28 (27.5)	63 (61.8)	11 (10.8)	
	>25 kg/m^2	20 (32.3)	39 (62.9)	3 (4.8)	
Physical activity	Yes	15 (14.7)	80 (78.4)	7 (6.9)	0.001
	No	37 (44.6)	34 (41.0)	12 (14.4)	

menstrual cycle, such as BMI and physical activity levels. Present study has been conducted to evaluate of the effect of age of menarche, BMI, physical activity on the length and regularity of menstruation cycle, a total of 185 girls were studied, their mean age was 22.3±3 years, mean age of menarche was 13.1±1.63 and mean BMI was 23.6±4.5 kg/m^2. Consistently Zeru AB et al[8] reported that the average age of the study subjects was 20.6±1.4 years. On the other hand, Song S et al[12] reported that average age of the subjects was 30.83 years. In the line of this series Ramraj B et al[13] reported that the average age that teenage girls start having periods was 12.5±1.42 years and their mean BMI was 26.34 kg/m^2.

In this study according menstrual cycle pattern, 28.10% girls had short menstrual cycle pattern, 10.30% girls had long menstrual cycle pattern, while 61.60% girls had normal menstrual cycle pattern. In the comparison of this study Zeru AB et al[8] reported that the out of all study subjects 32.6% of the cases had menstruation irregularities and among menstrual irregularities, irregular onset seems to be the commonest issue 19.8%.

In this study menstrual cycle pattern was statistically insignificant according to age and BMI (p=>0.05), while it was statistically significant according to age of menarche and physical activity (p = <0.05). In the study by Song S et al[12] reported that the women who engaged in intensive physical exercise were less likely to experience irregular periods, whereas women whose jobs required them to stand for long periods of time or lift heavy objects frequently were more likely to do so. Haniarti et al[14] also found menstrual irregularities significantly high in overweight women. In the line of this series, Mittiku YM et al[15] observed that menstrual irregularity was significantly associated with several variables, including being under 20 years old, having a history of early menarche, being overweight, and experiencing perceived stress. According to the study's findings by Pratami M et al[16] that there was a notable correlation between menstrual pattern disorders and physical activity among female student soldiers undergoing basic education in the Indonesian military. According to the findings of a study that was carried out on 2613 Danish women between the ages of 18 and 40, a lack of physical activity and excessive drinking were shown to be connected to an increase in irregular menstrual periods.[17,18] In the comparison of this study, Tang Y et al[19] reported that, although there was no observed correlation between BMI and the duration of the menstrual cycle or the length of menses, there is a positive association between BMI and menstrual blood loss. Research has shown that the age of menarche can impact the menstrual cycle. Girls who start their periods at a younger age may have a longer menstrual cycle and irregular periods compared to girls who start their periods later. This is because the body is still adjusting to the hormonal changes that occur during puberty, which can cause fluctuations in menstrual cycle length and regularity. BMI, on the other hand, refers to a person's weight in relation to their height. Studies have shown that women who have a higher BMI may experience irregular menstrual cycles, longer periods, and heavier bleeding. This is because excess body fat can impact the production and regulation of hormones that control the menstrual cycle, such as estrogen and progesterone. Physical inactivity can impact the menstrual cycle in several ways. Regular exercise and physical activity are essential for maintaining overall health and hormonal balance, which can in turn regulate the menstrual cycle. Research has shown that women who engage in regular physical activity tend to have more regular menstrual cycles than those who are

sedentary. This is because exercise helps to reduce stress levels and regulate the production of hormones such as estrogen and progesterone, which are important for menstrual cycle regulation. Although the physical inactivity can disrupt the hormonal balance and cause menstrual irregularities. Women who lead a sedentary lifestyle are at an increased risk of developing menstrual disorders such as oligomenorrhea (infrequent periods) or amenorrhea (absence of periods). According to several study limitations, like limited by its sample size, which could affect the generalizability of the result. The study may be subject to recall bias, as some participants may have had difficulty accurately recalling details about their menstrual cycle history. Other factors that could impact menstrual cycle regularity, such as stress, diet, and medication use, were not taken into account in the study. Further longitudinal studies could be conducted to track changes in menstrual cycle regularity and length over time in relation to age of menarche, BMI, and physical activity.

Conclusion

As per the study conclusion, the irregular menstrual patterns, particularly short cycles, are more common among medical students. The results also indicate that younger age, early menarche, lower BMI, and less physical activity may be risk factors for irregular menstrual cycles. These findings could have important implications for the health and wellbeing of female medical students, as irregular menstrual patterns may be indicative of underlying health problems. Further research is needed to explore the underlying causes of menstrual irregularities in this population, and to develop effective interventions to promote menstrual health and wellbeing among female medical students.

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