**Dr. PVS Smruthi**
Intern, GSL Medical College, Rajanagaram, Andhra Pradesh, India

**Dr. Ravi Kiran**
Assistant Professor, Department of Community Medicine, GSL Medical College, Rajanagaram, Andhra Pradesh, India

**Dr. SK Jena**
Professor, Department of Community Medicine, GSL Medical College, Rajanagaram, Andhra Pradesh, India

**Dr. SK Mishra**
Professor & Head, Department of Community Medicine, GSL Medical College, Rajanagaram, Andhra Pradesh, India

# Impact of lifestyle and dietary habits on menstrual cycle among female medical students

**Dr. PVS Smruthi, Dr. Ravi Kiran, Dr. SK Jena and Dr. SK Mishra**

**Abstract**
**Background and Aim:** Menstrual patterns are influenced by a wide variety of factors which can be responsible for menstrual disorders, among them are lifestyle and dietary habits play a major role. So, the present study is effect of life style and dietary habits on the menstrual cycle among female medical college students and suggest them to adopt healthy life style and dietary habits accordingly.
**Materials and Methods:** A cross-sectional study was conducted among 200 students of all semesters in a tertiary care institute using simple random sampling method. A pre-tested and pre-designed, semi-structured and self-administered questionnaire was used to collect data. Data collected was analysed using SPSS trail version 24 and chi-square test was used wherever applicable.
**Results:** It was found that 29.1% had irregular menstrual cycle. 79.4% respondents took sugary food for more than 3 days/week. 43% did not have sleep duration of more than 7 hours/day. 52% did not regularly exercises for more than 5 times/week.
**Conclusion:** There was a significant association between consumption of junk food, physical activity, and sleep habits on menstrual cycle of the respondents. Regular exercise, more healthy food, good sleep, less stress is responsible to maintain a healthy regular menstrual cycle.

**Keywords:** Menstrual disorders, junk foods, physical activity, sleeping habits

## Introduction

Adolescence is a stage of enormous physical and hormonal change for a young girl. The female reproductive system is characterized by regular cyclic changes known as menstrual cycle [1]. The most essential feature is periodic bleeding from vagina which occurs along with the mucosal shedding of uterus. Female's first menstruation is called menarche. It is one of the indicators of maturity and can be used as a developmental landmark of a pubertal female. Menarche occurs averagely at the age of 12 years [2]. The end of a woman's reproductive phases called menopause, commonly occurs between the ages 45 and 55 years [3]. Menstrual cycle is a determinant of a woman's reproductive health. Regular menstrual cycle occurs every 28-35 days ± 2-3 days in which the menstrual flow lasts for 3-5 days with an average loss of 30-80 ml of blood.

Normal menstrual function depends on the complex interaction between the hypothalamic pituitary ovarian axis and endogenous hormones and alterations in these hormones can affect menstrual cycle characteristics, such as cycle length, bleeding patterns, and regularity [4]. Irregular menstrual cycle is any deviation from normal duration. The list of menstrual disorders may range from amenorrhea, irregular cycles, abnormal flow to dysmenorrhea and premenstrual symptoms. Menorrhagia denotes regular cycles with bleeding either excessive in amount (>80 ml) &/or, in duration with flow lasting >7 days. Hypomenorrhea is scanty menstrual flow which lasts for 35 days. Amenorrhea is absence or suppression of a menstrual period in a woman of reproductive age either temporary or on a permanent basis it is classified into primary and secondary amenorrhea. Oligomenorrhea is irregular or, in occasional usage, very light or infrequent menstruation. It is menstrual periods occurring at intervals of greater than 35 days, with only four to nine periods in a year [5].

Menstrual patterns are influenced by a wide variety of factors; among them no physical activity, poor dietary habits, increased stress, hormonal imbalance and so on [6-8]. Factors such as eating disorder, malnutrition, and low physical activity was common in medical students nowadays and these habits directly influence menstrual cycle [9]. The present study

**Corresponding Author:**
**Dr. PVS Smruthi**
Intern, GSL Medical College, Rajanagaram, Andhra Pradesh, India

is to identify these factors among the medical students and suggest them to adopt healthy life style.

## Objectives

1. To find out the prevalence of menstrual irregularities among female medical students.
2. To study the effect of life style and dietary habits on the menstrual cycle among the study subjects.

## Materials and Methods

A cross-sectional study was conducted among female medical student's during June-August 2022 in a tertiary care medical institute. A total of 199 female students in the age group ranging from 19-22 years, studying in various semesters i.e. of 2nd year, 3rd year and final year were identified for the present study.

All Students willing to participate were selected for the study after giving explanation about the purpose of the study and were given information on the questionnaire after obtaining consent. A pre-designed, pretested, semi-structured questionnaire was used for data collection. Questionnaire was used to collect personal history and information regarding food habits, sleeping habits, physical activities and menstrual cycle etc. The questionnaires were distributed in the class rooms during free time and instructions were given regarding filling up of the questionnaire and the filled in questionnaires were collected on the same day. Any difficulties in understanding the questionnaire were clarified.

The collected data was analyzed using SPSS trail version 24. The values are presented as mean, percentages & proportions and chi-square was used wherever applicable. P-value less than 0.05 was considered as statistically significant.

## Results

Out of the 199 students, 63.8% were above 20 years and 36.2% were less than 20 years. First year students were 42 (21%), second year students were 60 (30%), third year students were 56 (28%), final year students were 42 (21%). Study included 200 medical students with a mean BMI of 24.50. Analysis of BMI pattern revealed that about 59.8% of the students fall under normal BMI and 29.2% fall under overweight /obese BMI as shown in Table-1.

**Table 1:** Distribution of students based on Body mass index (BMI)

| BMI | Subjects | Percentage |
|---|---|---|
| Underweight (<18.5) | 22 | 11.0% |
| Normal (18.5-24.9) | 119 | 59.8% |
| Overweight / obese (25-35) | 58 | 29.2% |
| Total | 199 | 100% |

The menstrual pattern and characteristics of the participants was studied, and it was found that maximum number of participants attained menarche at the age of 11-13 years i.e., 184 (92.5%). No students were observed to have menarche at ages <10 and >17 years. The majority of the students about 134 (67.3%). had a duration of the menstrual flow of 2-5 days. Excessive menstrual flow (>6 Pads/day) was reported by 24 (12%) girls. The menstrual cycle length of 31-40 days was seen in 32 girls (16%) as shown in Table-2.

**Table 2:** Menstrual Patterns in Medical Students

| Menstrual Pattern | | No. of students | Percentage |
|---|---|---|---|
| Age at Menarche | 11-13 years | 184 | 92.5% |
| | 14-16 years | 15 | 7.5% |
| Duration of Flow | < 2 days | 10 | 5% |
| | 2-5 days | 134 | 67.3% |
| | 6-8 days | 40 | 20% |
| | > 8 days | 15 | 7.5% |
| Amount of Flow | Mild (<2 Pads/day) | 30 | 15% |
| | Moderate (3-5 Pads/day) | 145 | 73% |
| | Heavy (>6 Pads/day) | 24 | 12% |
| Cycle Length | <20 days | 7 | 3.5% |
| | 21-30days | 160 | 80% |
| | 31-40 days | 32 | 16% |

With respect to the nature of the menstrual cycle, it was observed that 141 (70.8%) girls had a regular menstrual cycle history and menstrual irregularities were reported by 58 (29.1%) girls as shown in Fig 1.
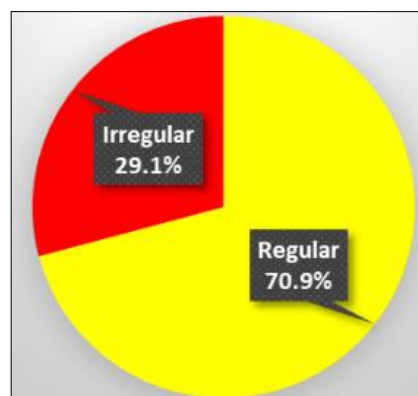


**Fig 1:** Prevalence of menstrual irregularity among students

Physical activity frequency and association with menstrual cycle regularity patterns in the medical students is shown in Table 3 and it is observed that there is a statistically significant association between physical activity and the duration of physical activity with menstrual cycle regularity patterns. Among the 199 medical students 99 (49.7%) exercised regularly. Among students with student with irregular cycles only 23 (39.6%) had physical activity when compared to 76 (53.9%) in students with regular cycles. A statistically significant association was also found between duration of work out and menstrual cycle regularity patterns.

Among the 199 medical students, 96 (48.2%) students consume fatty foods like burgers etc. >3days/week and 103 (52%) consume less than three times per week. It was also observed that 162 (82%) take healthy food like fresh fruits and leafy vegetables and 36 (18%) did not consume healthy food. Consumption of sugary foods like sweets and cakes was more than 3days/week in 123 (61%) students and a statistically significant association was also found between frequent consumption of sugary foods and menstrual cycle regularity patterns.

**Table 3:** Association between life style and dietary habits with menstrual cycle

| Lifestyle and dietary habits (n) | Irregular (58) | Regular (141) | p-value [χ2 test] |
|---|---|---|---|
| Doing physical activity (99) | 23 (39.6%) | 76 (53.9%) | 0.02 |
| Duration of workout <5times/week (104) | 43 (74.1%) | 61 (43.2%) | 0.001 |
| Sleep Duration <7hrs (91) | 33 (57%) | 58 (41.1%) | 0.04 |
| Consumption of fatty foods (Burger, Pizza) >3days/week (96) | 32 (55.2%) | 64 (45.3%) | 0.2 |
| Consumption of Sugary Foods (Cakes, Sweets) >3days/week (123) | 46 (79.4%) | 77 (54.6%) | 0.001 |

## Discussion
In the present study, the age of menarche among the age group 11 to 13 years was 92% and remaining 8% had menarche between 14-16yrs. A similar study was conducted by Begum et al. [10] had reported similar age groups in their study Additionally, the mean age for menarche is between 12-13 years old which have been found in previous literature of Herman-Giddens et al. [11] In the present study, 70.9% of the students had regular cycles and 29.1% had irregular cycles. Lifestyle factors like consumption of junk food and lack of physical activity were correlated with the menstrual patterns experienced by the female medical students. Medical students are at high risk for stress due to their academics and menstrual disorders because of their lifestyle according to the study conducted by Sood et al. [12]. Significant association was observed between junk food consumption and menstrual patterns. 79.4% of students consuming more of refined carbohydrates and sweets had irregular menstrual patterns whereas students with regular patterns consuming such diet were only 45.3%. Which is similar to the study by Lakkawar et al. [13] where a significant association between irregular menstrual cycles and sugary foods. However, another study reported no association between consumption of junk food and menstrual cycle [14].

It was also observed in the present study that menstrual cycle was regular among students who did regular exercise as regular physical activity helps to maintain ideal body weight, increases insulin sensitivity, increases BMR and release endorphins, which in turn helps in regularization of menstrual cycle. It was noticed that students who slept for more than 7 hours had regular menstrual cycle and the association between sleeping habit and menstrual cycle was statistically significant. According to Baker et al. [15] short sleep duration is associated with irregular menstrual cycles, which may impact reproductive health.

## Conclusion
Regular exercise, more healthy food and good sleep will help to maintain a healthy regular menstrual cycle.

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