

A cross-sectional study: prevalence of irregular menstruation according to socioeconomic and nutritional status, in female population of Meghalaya

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Abstract

Background: Menstruation is a normal physiological process and the factors which contribute to irregular menstruation are like hormonal imbalance, stress, thyroid disorders, polycystic ovarian disease, obesity, diabetes and other metabolic diseases including environmental, behavioral and nutritional factors affecting the quality of life of reproductive age group among females. This study was conducted to find out the rudimentary cause of irregular menstruation in relation to socioeconomic status and body mass index (BMI) among the females of Meghalaya. Socioeconomic status was measured in terms of literacy rate and household income of the individual and BMI in terms of nutritional status which helped in determining the prevalence of irregular menstruation in female population of Meghalaya. Irregular menstruation was prevalent among adult women and appeared to be associated with socioeconomic status, especially in terms of education and household income. This study's findings suggest that attention must be paid to women with low educational levels or high household incomes, to ensure early diagnosis and the provision of medical attention for irregular menstruation.

Methodology: The Study has been done in 100 females, enrolled from the OPDs of Department of Obst and Gynae of NEIAH and NEIGRIHMS, Shillong, Meghalaya. The dimensions measured were height, weight, mid-arm circumference, waist circumference. The B.M.I was calculated (Kg/m^2). Using a questionnaire, socio-economic profile of the participants was collected by personal interview. The data were checked for normality before statistical analysis using Kolmogorov Simonov test. The unpaired t test (for quantitative data to compare two independent observations) was applied. The chi square test was used for qualitative data comparison of all clinical indicators. Level of significance was set at $P \leq 0.05$.

Observations: There was marked relation found between height (p value-0.003), socioeconomic status (p value-0.03) and the menstrual irregularity. Significant p values for these parameters confirm the relation. In 57 percent of the cases, menses were found to be irregular without any hormonal disturbances. There was not much significance found in relation between age and irregular menstruation. Mid –arm circumference was not found to

be significant for irregularity. But Waist circumference has marked relation with the menses irregularity (p value- 0.03). Menses irregularity has marked relation with the weight of the participant, as evident from the significant p value (0.001).

Conclusion: In the present study, we observed a marked relation between irregular menstruation and height, weight, waist circumference. Further, there was marked relation between high socioeconomic status and menstrual irregularity.

Keywords: BMI, Irregular Menstruation, Nutritional status, Socio-economic status

Introduction

Aim and Objective: The study aimed to study the socioeconomic status and BMI of the females of Meghalaya, to determine the fundamental cause of irregular menstruation.

Background: Socioeconomic status in terms of education and household income as well as nutritional status in relation to BMI can help in determining the prevalence of irregular menstruation in female population of Meghalaya. Socio-economic and nutritional factors may be responsible for the variations in menstrual cycle. Irregular menstruation is an important indicator of current and potential health problems. Thus, it is necessary to evaluate the factors associated with irregular menstruation to determine appropriate preventive and treatment strategies.

Brief review of literature: Menstruation is a normal physiological process and irregular menstrual pattern is a problem affecting the quality of life among women in the reproductive age group.¹ Menstrual irregularity, that means irregular menstrual cycle, is a form of abnormal menstruation which can result from several causes, e.g. the underlying disease (i.e., endometriosis, type 2 diabetes mellitus, etc.), use of medications (i.e., anti-

depressants, anti-androgens, etc.), weight imbalances (underweight or obesity), smoking habit, and reproductive factors (age at menarche, parity, etc.)²⁻⁷ Other factors which might lead to irregular menstruation include hormonal imbalance, stress, thyroid disorders, polycystic ovarian disease, and metabolic diseases including environmental, behavioral and nutritional factors affecting the quality of life of reproductive age group among females. Irregular menstruation can have various health implications, and is an indicator of health in women.⁸ The prevalence of irregular menstruation varies from 5% to 35.6% depending on age, occupation, and the country of residence.⁸⁻¹¹ Early diagnosis and treatment of menstrual irregularities can help to reduce the occurrence rates of infertility and the sequelae of serious diseases.^{5-7, 12} Socioeconomic inequality can be an important determinant of health and health behaviors in adults.¹³⁻¹⁴ Socioeconomic status can affect the development of chronic diseases such as diabetes, obesity and hypertension, and health behaviors such as smoking and eating habits.^{13,15-17} Hence, it is necessary to understand the relationship between socioeconomic status and irregular menstruation, as this can be an indicator of female health.¹⁸ There have been many research studies conducted on the relation between various socioeconomic factors, BMI and irregular menstruation.^{1,18-20} Although many factors contribute to the irregularity in menstrual cycles this study was conducted to find out the relationship between the body mass index (BMI) and irregular menstrual pattern. Healthier lifestyle practices, including, weight control, stress control, anemia control, and avoid alcohol intake are important factors in controlling menstrual irregularity.¹⁹ This study is conducted to find out the rudimentary cause of irregular menstruation in relation to socioeconomic status and body mass index (BMI) among

the females of Meghalaya. Socioeconomic status was measured in terms of literacy rate and household income of the individual and BMI in terms of nutritional status helped in determining the prevalence of irregular menstruation in female population of Meghalaya.

The rationale of the study: Irregular menstruation in female population of Meghalaya is very common, which may be due to Socio-economic and nutritional factors. So, population based study is needed. Socio-economic and nutritional factors may be responsible for the variations in menstrual cycle. Irregular menstruation is an important indicator of current and potential health problems. Thus, it is necessary to evaluate the factors associated with irregular menstruation to determine appropriate preventive and treatment strategies.

Materials and Methods

Design and Sample: The study was a cross sectional study, done on 100 subjects. Volunteers who wished to withdraw from the study were not included.

Inclusion criteria:

- Healthy females belonging to Meghalaya
- Females aged 14-40 yrs
- Females having no history of hormonal imbalance.

Exclusion criteria:

- Females suffering from any chronic disease or other comorbidities.
- Pregnant and lactating females.
- Females with hormonal imbalance.
- Females with early menopause.

Procedures

No. of groups to be studied: ONE.

Sampling

- Population: all volunteers who fulfill the inclusion criteria and who are willing to participate are included in the study.
- Sampling method: Convenient sampling.

Randomization Details

- Selection of participants:

All volunteers who fulfill the inclusion criteria and selected by convenient sampling.

Methods

The subjects were enrolled from the OPDs of Department of Obst and Gynae of NEIAH and NEIGRIHMS. The volunteers who satisfied the inclusion and exclusion criteria were selected. That was done after obtaining Clearance from the Institutional Ethics Committee.

Stadiometer, weighing machine and Measuring Tape were used to measure the Anthropometric measurements. The dimensions measured will be height, weight, mid-arm circumference, waist circumference. The B.M.I was calculated (Kg/m^2). Using a questionnaire socio-economic profile of the participants was collected by personal interview. Data collection was done in Microsoft excel and statistical analysis was done to note any differences in the study population. All the statistical tests will be considered statistically significant at a p value of less than or equal to 0.05.

- List of variables and their measurement methods with standardization techniques
 - (i) Independent variables: Age, Height, Weight, Mid-Arm circumference, Waist circumference
 - (ii) Dependent variables: B.M.I.
- Data collection methods including settings & Periodicity : One-time measurement of height, weight, Mid- Arm circumference, Waist circumference was done. B.M.I. was calculated.
- Statistical tests to be used for data analysis: Chi-square test

Measurement criteria: Anthropometric Measurements are noninvasive quantitative measurements of the body. According to centers for Disease Control and Prevention, anthropometry provides a valuable assessment of

nutritional status in children as well as adults. In Adults, body measurements can help to assess health and dietary status and future disease risk. These measurements can also be used to determine underlying nutritional status and diagnose obesity.²¹

Statistical analysis

The data was coded and entered into Microsoft Excel spreadsheet. Analysis was done using IBM SPSS (SPSS Inc., IBM Corporation, NY, USA) Statistics Version 25

Observations

Table 1: Menses irregularity

	Frequency	Percentages
Yes	57	57
No	43	43
Total	100	100

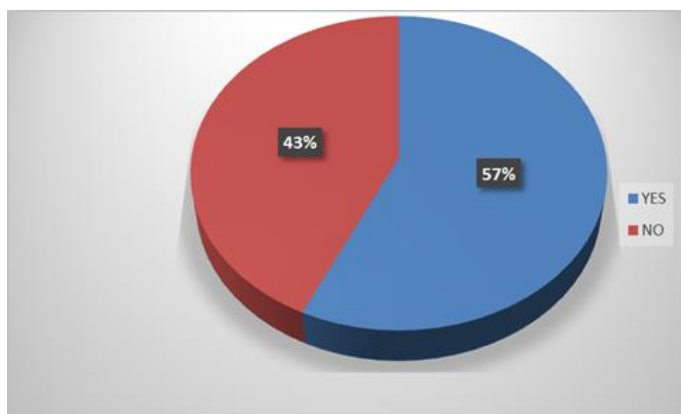


Figure 1:

In 57 percent of the cases, menses were found to be irregular without any hormonal disturbances

Table 2: Comparison between Age and Menses irregularity

	Mean	Std. Deviation	P value
Yes	27.18	7.234	0.606
No	27.98	8.193	

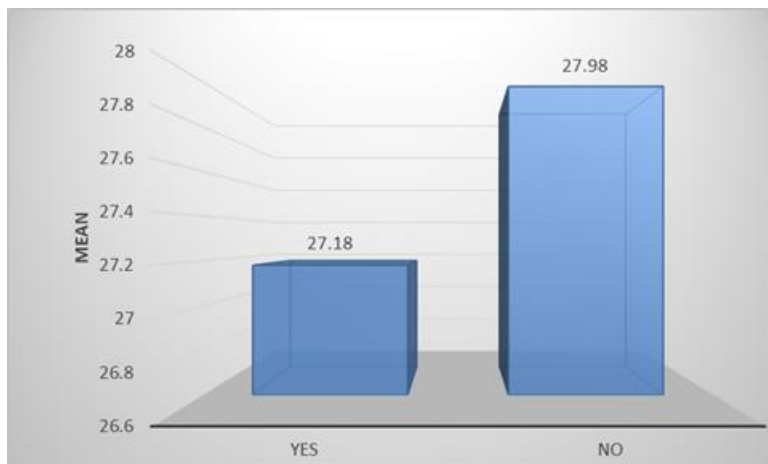


Figure 2:

There was not much significance found in relation between age and irregular menstruation. P value of 0.6 is insignificant.

Table 3: Comparison between Menses irregularity and Socio-economic Status

			Socio-economic Status		Total
			APL	BPL	
Menses	No	N	30	13	43
		%	69.8%	30.2%	100.0%
	Yes	N	28	29	57
		%	49.1%	50.9%	100.0%
Total		N	58	42	100
		%	58.0%	42.0%	100.0%

P value=0.03 (S)

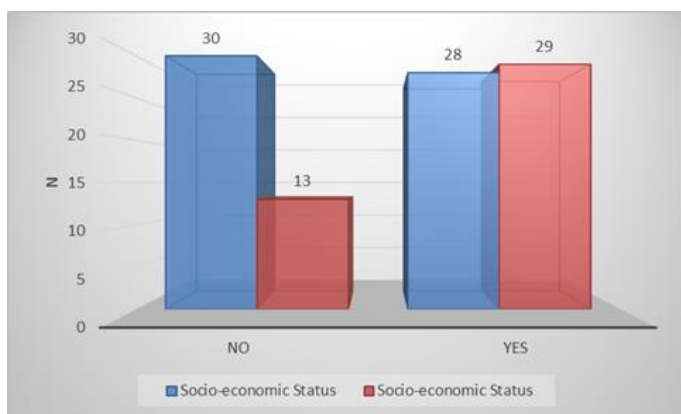


Figure 3:

Table 4: Comparison between Menses irregularity and Anthropometry data

		Mean	Std. Deviation	P value
Height (cm)	Yes	152.73	6.25	0.003 (S)
	No	148.42	7.66	

Weight(Kg)	Yes	53.56	17.403	0.04 (S)
	No	47.94	6.24	
BMI	Yes	22.21	6.39	0.67
	No	21.72	1.97	

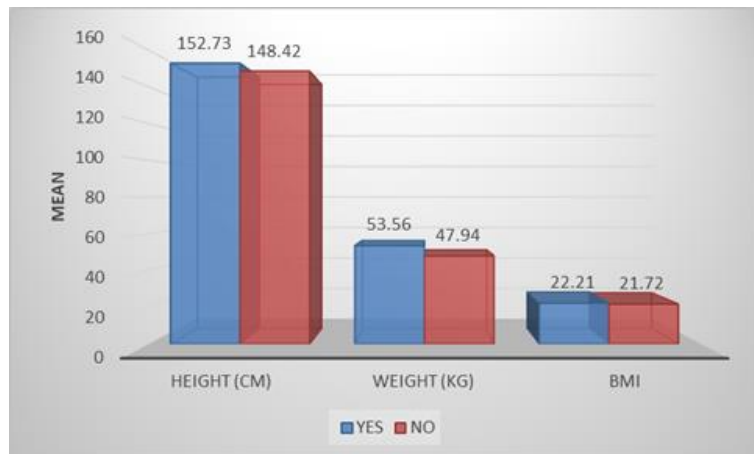


Figure 4:

There was significant relation found between height measurement and the menses irregularity. Also, there was marked relation between weight measurement and menses irregularity. Significant p values confirm the relation.

Table 5: Comparison between Menses irregularity and Circumference

		Mean	Std. Deviation	P value
Mid-arm circumference(CM)	Yes	21.111	8.4705	0.35
	No	19.663	6.7592	
Waist Circumference(CM)	Yes	66.246	33.2844	0.03 (S)
	No	52.465	29.1534	

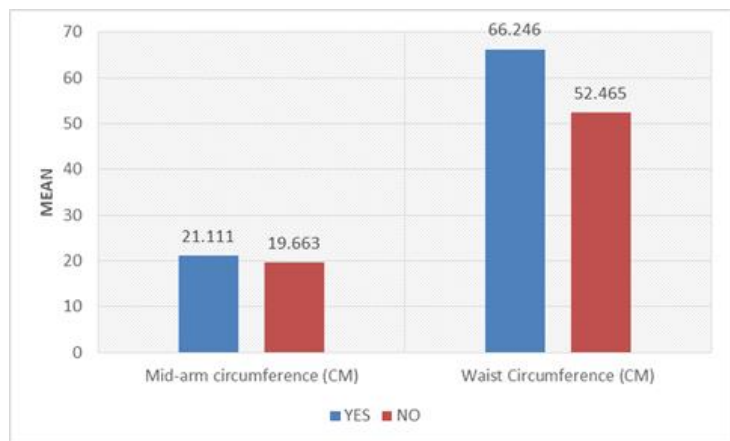


Figure 5:

Mid –arm circumference was not found to be significant for irregularity. But Waist circumference has marked relation with the menses irregularity.

Table 6: Comparison between Menses irregularity and Remarks

			Remarks			Total
			Normal	Overweight	Underweight	
MENSES	NO	N	43	0	0	43
		%	100.0%	0.0%	0.0%	100.0%
	YES	N	0	26	31	57
		%	0.0%	45.6%	54.4%	100.0%
Total		N	43	26	31	100
		%	43.0%	26.0%	31.0%	100.0%

P value=0.001 (S)

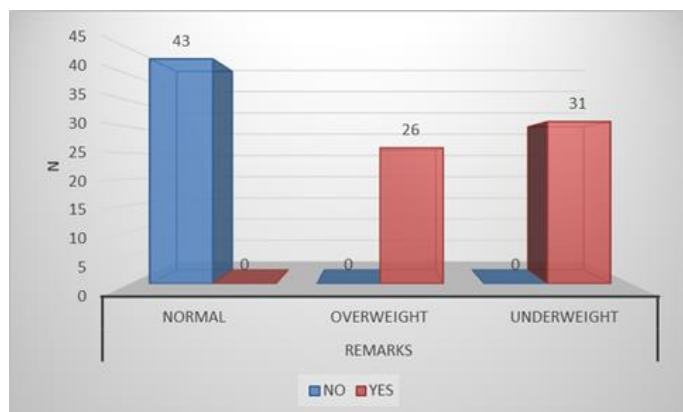


Figure 6:

Menses irregularity has marked relation with the weight of the participant, as evident from the significant p value.

Results:

- There was marked relation between socioeconomic status and the menstrual irregularity.
- There was significant relation found between height and the menses irregularity.
- There was marked relation between weight and menses irregularity. Significant p values confirm the relation.
- Waist circumference has marked relation with the menses irregularity.
- Menses irregularity has marked relation with the weight of the participant

Discussion

According to this study, 57 percent of the participants had irregular menses. The irregularity may be associated with the socioeconomic and nutritional factors. As found from the study waist circumference, height and weight has marked relation with the problem, which in turn signifies relation between BMI and irregularity.

Socio-economic and nutritional factors as well as environmental factors are responsible for the variations in menstrual cycle. Irregular menstruation is an important indicator of current and potential health problems. Nutritional factors are assessed using BMI scale. A woman's health is greatly influenced by her socioeconomic status.

Obese women with high WC and BMI values have elevated levels of insulin and testosterone, and a free androgen index, while the level of sex hormone-binding globulin is decreased, leading to the hormonal changes that cause menstrual irregularity

Limitations

As it is a cross sectional study, this study is conducted within short span of time and non probability sampling method is used and is mainly based only on the risk factor of menstrual irregularity without adjusting for other factors so that further studies have to be carried out using probability sampling method to analyze the relation between all other possible risk factors among urban and

rural women so that a comprehensive and comparative picture can be obtained.

Conclusions

Irregular menstruation is an important indicator of health problems and it is necessary to evaluate the factors associated with irregular menstruation to determine appropriate preventive and treatment strategies. In the present study, we observed a marked relation between irregular menstruation and height, weight, waist circumference. Further, there was marked relation between socioeconomic status and menstrual irregularity. There is a need to recognize the need for early education, detection of at-risk populations and stress the importance of building a multidimensional understanding of irregular menstruation involving socioeconomic and nutritional factors.

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