



A STUDY TO ESTABLISH RELATIONSHIP BETWEEN VARIOUS FACTORS WITH MENSTRUAL IRREGULARITY AMONG RURAL WOMEN IN BHOPAL DISTRICT, MADHYA PRADESH

Dr. Shweta Singh

Ph. D. Scholar, L. N. University, Bhopal (M. P.)

Dr. Avadhesh Diwakar*

Assistant Professor, Department of Community Medicine, G. R. Medical College, Gwalior (M. P.). *Corresponding Author

ABSTRACT **BACKGROUND:** Menstruation is a normal physiological process and irregular menstrual pattern is a problem that affects routine life of women in the reproductive age group. There are so many factors may contribute to the irregularity in menstrual cycles. This study was conducted with the purpose to establish relationship between various factors with menstrual irregularity among women.

METHODS: It was a cross-sectional study, conducted in the rural health and training center associated to L. N. Medical College, Bhopal between August 2020 to October 2020 by using a convenience sampling method. The data was collected from 220 women in the reproductive age group and analyzed to find out the relationship between the BMI and menstrual irregularity.

RESULTS: The mean age of the study participants was 30.64 (± 8.32) years and their mean age at menarche was 12.28 (± 1.86) years. Majority of the study participants belongs to lower middle class (25%), Hindus (84.54%) by religion, married (82.20%), homemakers (53.64%) belong to nuclear family (45%) having education up to high school level (61%). Only 44.17% of the participants have their BMI within normal range and 07.97% are obese. Irregular menstrual pattern was present in 18% of the study participants. The association between the BMI and the irregular menstrual pattern was found to be significant with a $p < 0.05$.

CONCLUSIONS: A significant association between the BMI and the irregular menstrual pattern highlights the importance of adapting simple and effective lifestyle and behavioral modifications in the reduction of excess weight thereby leading to healthy reproductive life among women.

KEYWORDS : Body mass index, Menstrual irregularity, Obesity

INTRODUCTION

Menstruation is a normal physiological process which every woman undergoes for more than 35 years in her lifetime from menarche till menopause.¹ Menstrual cycles are said to be regular when the cycle length is between 21 to 35 days with a menstrual flow for 2 to 7 days and any deviation from this normal menstrual pattern i.e., either with increased or decreased duration of cycles (polymenorrhea or oligomenorrhea), heavier (menorrhagia) or decreased flow, associated with other symptoms like severe abdominal cramps (dysmenorrhoea) is considered as abnormal or irregular menstrual cycle. Irregular cycles is common during the beginning phase of menstruation in life (menarche), around the time when it is going to end (peri-menopausal period), after pregnancy and during some medications like hormonal contraceptives but if the cycles are continuously irregular in the last six months without any physiological reasons it needs to be addressed as early as possible.²⁻⁴ There are many factors responsible for the irregular menstrual pattern which includes stress, hormone imbalance, thyroid disorders, increased weight gain, polycystic ovarian disease, diabetes, metabolic syndrome, medications, environment, behavioural and lifestyle factors. Irregularity in the menstrual cycles can have a serious impact on the immediate as well as long-term health of the women causing distressing symptoms affecting the metabolism, sleep, fertility, sexual, reproductive life and more.

Obesity or excessive weight gain is a global issue affecting more than 13% of the adult population particularly females (15%). Overweight a prequel to obesity was present in almost 39% of the global adult population with slightly female predominance (40%).⁵ Although irregular menstrual pattern has numerous causes obesity is one of the most important risk factors as most of the time the women failed to realize it as a cause for the irregularity and also it is easily preventable and modifiable with simple but effective lifestyle, behavioural and dietary modifications without the support of unnecessary medications. Body mass index (BMI) is one of the simple and commonly used indices (taking into account the height and weight of the individual which can be easily recorded without much intervention) for the assessment of obesity among adults. Although many studies conducted across the globe to establish the association between body weight and menstrual pattern among adolescent girls the current study focused on women in the reproductive age group as a whole instead of particular age groups and tried to bring out the relationship between the BMI and irregular menstrual pattern especially in the rural areas.

MATERIAL & METHOD

A cross-sectional study was conducted in the rural health and training center associated to L. N. Medical College, Bhopal district, Madhya Pradesh for a period of three months between August 2020 and October 2020. Based on the data from a study in India prevalence of

menstrual irregularity among rural women was taken as 14% with 95% confidence level and 5% absolute precision assuming a non-responsive rate of 10% the minimum required sample size was calculated to be 211.⁶ Using convenience non-probability sampling method all female patients attending the outpatient department of the rural health training center fulfilling the eligibility criteria (i.e., non-pregnant women in reproductive age group without using any hormonal contraceptives and free from any pre-existing chronic disorders like thyroid, reproductive tract diseases, diabetes etc.) during the study duration were included in the study after giving proper information regarding the nature of study and obtaining the consent to participate in the study. Using a pre-tested questionnaire socio-demographic profile of the study participants were collected by personal interview. The height and weight of all the study participants was recorded using a stadiometer and standardized weighing scale for calculating the BMI. We were able to collect the data from 220 women in the reproductive age group within the study duration which is well above the minimum sample size required.

The collected data were entered in Microsoft Excel and after cleaning analyzed with SPSS version 21.0. WHO classification of BMI was used to classify the study participants as normal (18.5-24.99), underweight (< 18.5), overweight (25-29.99) and obese (≥ 30) and modified BG Prasad scale 2018 was used to determine the Socio-economic status of the study participants.^{7,8} Results were tabulated and descriptive statistics was used for socio-demographic profile of the study participants and chi-square test/Fischer's exact test (wherever applicable) was used to find out the association between the BMI and other variables with the menstrual irregularity. A p-value of less than 0.05 was considered to be statistically significant.

RESULT

The mean age of the study participants was 30.64 (± 8.32) years and their mean age at menarche was 12.28 (± 1.86) years (Table 1).

TABLE: 01 Age wise distribution of respondents

S. No.	PARAMETERS	Mean	S.D	p-value
1	Age of the study participants (years)	30.64	8.32	0.20
2	Age at menarche (years)	12.28	1.86	

Majority of the study participants were Hindus (85.54%) by religion followed by Muslims (13.63%) and Christians (01.83%), belonging to class IV (lower middle class 25%) and class III (middle class 23.18%) socio-economic status. Most of the females were married (82.20%), single (15.95%) and less than 2% of the women were either widowed or divorced. Majority of the females were housewives (53.64%) followed by working women (39.09%), students (07.27%) and belongs to

nuclear family (45%). More than 60% of the females who participated in the study were educated till high school, 20.90% were illiterates and 18% were graduates (Table 2).

As per the study findings 44.17% women have BMI within the normal range followed by 26.99% were overweight and 20.85% were under weight and 07.97% of the study participants were obese as per the WHO standards. Among the obese women more than 69% have menstrual irregularities suggesting a strong relationship between the two when compared to women with normal BMI (7%).

Study findings reveals that there is no significant association between education, occupation and religion of the study participants with the menstrual pattern as the $p > 0.05$. Association between age at menarche and the socio-economic status of the study participants with menstrual irregularity was also not found to be significant with p values of 0.20. But the relationship between the BMI and the irregular menstrual pattern was found to be significant with $p = 0.0003$ (OR:3.078, CI:1.077-8.801) and with further analysis involving the individual categories of BMI the association between the obese women and menstrual irregularity when compared to underweight or overweight women was found to be extremely significant with a $p < 0.00001$ (Table 2).

Table: 02 Distribution Of Respondents According To Different Parameters

S. No.	PARAMETERS	Normal menstruation N (%)	Irregular menstruation N (%)	Total N (%)
EDUCATION				
1.	Illiterate	07	39	46 (20.90)
2.	Primary	09	32	41 (18.67)
3.	Secondary	14	35	49 (22.27)
4.	Higher secondary	07	38	45 (20.45)
5.	Undergraduate	03	28	31 (14.09)
6.	Post graduate	01	08	09 (04.09)
	Total	41	179	220 (100.00)
p-value - 0.76				
OCCUPATION				
1.	Student	05	11	16 (07.27)
2.	Housewife	27	91	118 (53.64)
3.	Working	08	78	86 (39.09)
	Total	41	179	220
p-value - 0.71				
RELIGION				
1.	Hindu	35	151	186 (84.54)
2.	Muslim	06	24	30 (13.63)
3.	Christian	00	04	04 (01.81)
	Total	41	179	220
p-value - 0.98				
MARRIATAL STATUS				
1.	Single	07	29	36 (15.95)
2.	Married	34	146	180 (82.20)
3.	Divorced	00	01	01 (00.61)
4.	Widowed	00	03	03 (01.22)
	Total	41	179	220
p-value - 0.72				
TYPE OF FAMILY				
1.	Nuclear	23	76	99 (45.00)
2.	Joint	03	29	32 (14.54)
3.	Three generation	15	74	89 (40.46)
	Total	41	179	220
p-value - 0.18				
SOCIO-ECONOMIC STATUS				
1.	I	05	31	36 (16.36)
2.	II	07	33	40 (18.18)
3.	III	09	42	51 (23.18)
4.	IV	12	43	55 (25.00)
5.	V	08	30	38 (17.27)
	Total	41	179	220
p-value - 0.89				
BMI				
1.	Underweight	04	42	46 (20.85)

2.	Normal	12	85	97 (44.17)
3.	Overweight	06	53	59 (26.99)
4.	Obese	09	08	17 (07.97)
	Total	41	179	220
p-value - 0.0003				

DISCUSSION

The mean age of the study participants was 30.64 (±8.32) years which is almost similar to a study conducted by Gunjan et al in Delhi among the reproductive age group women in which the mean age of the study participants was 29.9 (±9.7) years.⁹ Likewise the mean age at menarche of the study participants (12.28±1.86 years) matches with the study conducted by Siti-Arfah et al in Selangor (12.21±1.09 years) and also with various other studies.^{6,10,11} Most of the study participants belongs to lower socio-economic class and educated only up to high school level or even lower which may have determined their knowledge and awareness level regarding the importance of maintaining the body weight under control and its relationship with menstrual cycle. Although other studies show a significant association between the age at menarche and socio-economic status with the menstrual irregularity our study failed to establish the same, may be due to the small sample size or the sampling methodology we used involving all eligible participants within the time frame and restricting the study to rural area only.^{10,12} But there are some studies which favour our insignificant association of age at menarche with Menstrual irregularity.¹³ Majority of the study participants were married and housewives which may be a reason for their weight gain due to lack of self-care and in turn the irregularity in menstrual pattern.

The prevalence of obesity in our study was around 8% which is slightly lower than the global prevalence which is around 15% among adult females.⁵ The prevalence of irregular menstrual cycles was found to around 18% (C.I=8.7-19.7) which was slightly higher compare to the study conducted among rural women in Kashmir by Samreen et al were the prevalence was found to be around 10% and also comparable with the global prevalence which is between 14% to 25%.^{3,6,14} This shows the strong comparability in terms of prevalence of menstrual irregularity within the nation (northern and southern parts of the country) and also with the other nations across the globe irrespective of the place of the study. Our study finds a very strong and significant association between the BMI and irregular menstrual pattern similar to various studies across the globe.^{15,16} This strong association particularly among obese when compared with those belong other categories of BMI signifies that if BMI is kept within the normal range or even switching over to a lower weight category (i.e., obese to overweight) by adapting simple but proven effective measures like physical activity, dietary modifications etc., we can regulate the menstrual cycles to a certain extent without the requirement of any medications.

CONCLUSION

Although many factors contribute to irregularity in menstrual cycle we studied the relationship between the BMI and menstrual irregularity and found a significant association between the two highlighting the importance of adapting simple and effective behavioral, lifestyle and dietary modifications to maintain the BMI within the normal range by losing the excess weight gained thereby preventing the irregularity in menstrual cycles and eventually leading to a healthy and productive reproductive life among women.

LIMITATIONS

Being a cross-sectional study conducted within a short duration of time we used a non-probability sampling method and focused on only one of the risk factor for menstrual irregularity without adjusting for other confounding factors so further studies have to be carried out using probability sampling techniques to analyze the relationship between all the other possible risk factors among both rural and urban women to give a comprehensive and comparative picture of the same.

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