

Different Body Mass Index and Menstrual Irregularity in Women Attending Gynecological outpatient Clinic in Al Batool Maternity Teaching Hospital in Baquba City

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ABSTRACT

Menstrual irregularities pose serious problems for women's quality of life and contribute to anxiety in reproductive age group and many underlying reasons responsible for this and the most important one changes in the BMI so this study aim to found if menstrual irregularities effected by BMI. In a cross-sectional study, 91 women who were admitted to an outpatient clinic served as the participants. The three categories employed in this study were: underweight (<18.4kg/m²), normal weight (18.5-22.99kg/m²), overweight (23-27.49kg/m²), and obese (over27.50kg/m²). To analyze the effects of various factors on these groups, estimates of the number, percentage, proportion, and chi-square were used. P-values less than 0.01 were considered to be very significant. According to our data, 12 women were underweight, while 7 women had a BMI under 30, making up the smallest category. A total of 46 women had an overweight body mass index. According to our findings, the age group of 18–29 years had the highest BMI (severe obesity). All age groups had low body weights (BMI 18.5) in equal percentage. Body mass index (BMI) and various age groups did not have a statistically significant association, p-value (0.536). With a p-value of 0.18, the association between BMI and dysmenorrhea was not statistically significant. There is no relationship between the various body mass index (BMI) categories and irregular menstrual cycles. Our data also revealed that there is no connection between BMI and menstrual cycles including (duration, amount of blood loss and dysmenorrhea) or between BMI and age of the various groups.



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1. Introduction

Menstruation is regarded as a normal physiological state that involves number of changes in the endometrial structure and function as well as the production of reproductive hormones [1], [2]. Menstruation is considered regular when it lasts between 21 and 35 days and flows for 2 to 7 days. Any variations in these

parameters (frequency and duration) are regarded as irregularities, which pose serious problems for women's quality of life and contribute to anxiety in reproductive age group [3], [4]. Infertility, osteoporosis, diabetes, cardiovascular diseases, endometrial cancer, breast cancer, and neurological disorders are additional lifelong effects of irregular menses, according to a number of studies [5], [6].

Menstrual disorders can have a wide variety of underlying reasons but some literature links stress to a number of neuroendocrine alterations that are crucial to the pathophysiology of anovulation brought on by weight loss [7]. Other studies have shown a connection between nutrition, eating disorders, BMI, and exercises [8]. Body mass index (BMI) is calculated by dividing a person's weight (in kilograms) by the square of their height (m^2). The formulas used universally in medicine produce the measurement unit kg/m^2 [9]. Because the body's fat plays a significant role in the regulation of reproductive function, the majority of sex steroids are produced by fat cells. As a result, large amounts of estrogen are produced from large amounts of fat, and vice versa, which causes abnormalities in menstruation and ovulation in thin women who had low level of estrogen [10]. On the other hand, researchers found that an elevated level of testosterone that occur in women with central or peripheral obesity associated with polycystic ovarian syndrome which in turn responsible for menstrual irregularities and anovulatory dysfunction also they found increase in free and total androgen level and decrease in sex hormone binding globulin (SHBG) in obese women associated with oligmenorrhea and amenorrhea [11]. So the purpose of this study was to investigate the relationship between BMI (body mass index) and irregularity in the menstrual cycle.

2. METHODS

A cross-sectional study was conducted on 91 women who were admitted to the obstetrics and gynecology outpatient clinic at Al-Batool Maternity Teaching Hospital in Baqubah, Diyala, Iraq.

During the period from February to April 2022, approval for this study was obtained from the ethics committee for scientific research at the college of medicine - University of Diyala. In this study, a total of 91 women who came to our hospital for a routine gynecological examination were randomly selected and asked to voluntarily complete a questionnaire. Also, a written informed consent was obtained from them.

Women with any chronic gynecological disorders that could potentially affect the menstrual cycle and those with any endocrinological disorders including diabetes were excluded from our study. Pregnant women were likewise not allowed to participate.

The questionnaire was filled out voluntarily by all of these women. Age, weight, height, parity and gravida, the average length of menstrual cycles, the length of menses, and the number of pads used during menses were included in the questionnaire.

Based on the ethnicity-specific WHO classification for Asian women, BMI was calculated and accordingly women classified into 3 groups: underweight ($<18.4kg/m^2$), normal weight ($18.5-22.99kg/m^2$), overweight ($23-27.49kg/m^2$), and obese ($over27.50kg/m^2$) (3), to observe if any group of them had specific menstrual disorders regarding length of menstruation, or amount of blood loss or other parameters in the study.

To date, no standard method for measuring menstrual blood loss has been established. Therefore, in this study the amount of menstrual blood loss was divided into three parts to be evaluated easily: light (less than 15pads used during menses), medium (15 to 20 pads used during menses); and heavy (more than 21 pads used during menses).

Statistical analysis was performed using SPSS program (version 26 -2016). Number, percentage, proportion, and chi-square were estimated and used to test the effect of different factors. P-value of 0.05 was used to indicate the level of significance, p-value \leq 0.01 considered highly significant.

3. RESULTS

A total of 46 (50.5%) out of 91 women has overweight body mass index, and the smallest group belonged to 7 women (7.7%) with BMI \geq 30 while 12 women (13.2%) were underweight and the normal BMI counted 26 women (28.6%). Fig. 1

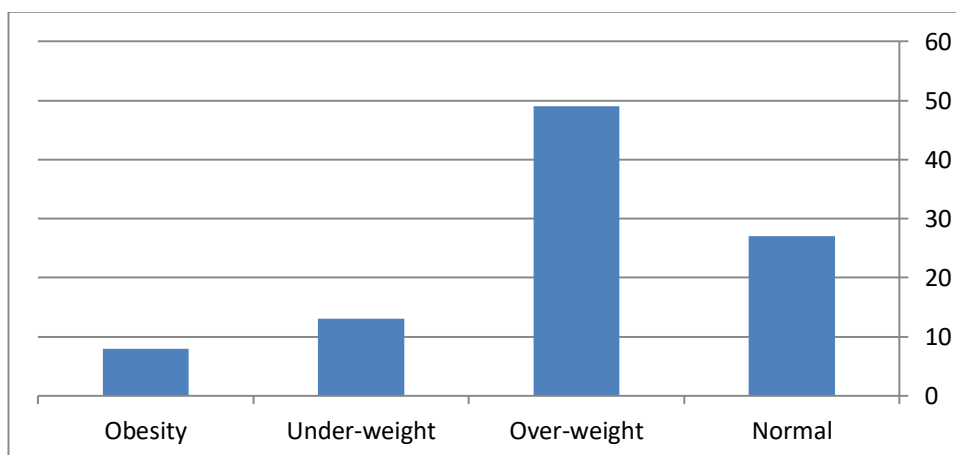


Figure 1: Number of women in each BMI group.

In terms of the relationship between BMI and the age factor, it was found that the age range of 18 to 29 years had the highest BMI (severe obesity) (57.1 percent). Additionally, 60.9% of the same age group members were obese, with BMIs \geq 18.5 being the same across all age groups. All of these results demonstrated that there is no correlation between body mass index (BMI) and various age groups, (p-value) (0.536) as displayed in table 1.

Table (1): The relationship between BMI and different age groups

BMI	18-29 y N (%)	30-40 y N(%)	Total N(%)	Chi-square
<18.5	6(50 %)	6(50 %)	12(100 %)	0.536
18.5-24.9	19(73.1%)	7(29.9%)	26(100 %)	
25-29.9	28(60.9 %)	18(39.1 %)	46(100 %)	
30-34.9	4(57.1 %)	3(42.9 %)	7(100 %)	

Regarding the relationship between dysmenorrhea and BMI, table 2 shows that the incidence of dysmenorrhea was 25% in BMI (30-39.9) while 75% of this group had no dysmenorrhea, lower incidence found with overweight patient 4% and 95.9% had no dysmenorrhea with this BMI. Based on these findings, there was no statistically significant relationship between BMI and dysmenorrhea, with a p-value of 0.18.

Table (2): The relationship between BMI and Dysmenorrhea

BMI	Negative (N%)	Positive (N%)	Total	P-value
18.5-24.9	23(85.2 %)	4(14.8 %)	27(100 %)	0.181
<18.5	11(84.6 %)	2(15.4 %)	13(100 %)	
25-29.9	47(95.9 %)	2(4.1 %)	49(100 %)	
30-34.9	6(75 %)	2(25 %)	8(100 %)	

Table 3 displays the menstrual blood loss patterns by BMI category. Medium blood loss was more frequently seen in women with BMIs of 69 percent, followed by normal body weight of 66.7 percent, obesity of 62.5 percent, and then overweight of 59.2 percent. However, statistical analysis indicated that these findings were not significant ($p=0.904$).

Table (3): The BMI and menstrual blood loss

BMI	Light	Medium	Heavy	Total	P-value
18.5-24.9	6(22.2%)	18(66.7%)	3(11.1%)	27(100 %)	0.904
<18.5	3(23.1%)	9(69.2 %)	1(7.7%)	13(100 %)	
25-29.9	11(22.4 %)	29(59.2 %)	9(18.4 %)	49(100 %)	
30-34.9	1(12.5 %)	5(62.5 %)	2(25 %)	8(100 %)	

4. DISCUSSION

Our study showed that there was no statistically significant association between body mass index (BMI) and different age groups; this finding is inconsistent with the results of previous studies conducted by [12] and another study done by [13] which found that as age increased from 49 to 55 years, BMI increased until age 64 years, after which it decreased. It also conflicts with research on the Saudi population, which found that there was a correlation between BMI and age [14].

This study demonstrated that there was no significant relationship between BMI and various age groups in terms of menstrual cycle length. Contrary to what we found, [15] discovered a statistical relationship between women's body mass index and menstruation length. Contrary to numerous other studies [16- 19], our study's small sample size may be attributable to our population's attitudes toward the menstrual cycle, since many members of our population feel embarrassed to discuss the subject with gynecologists. This is likely owing to poor educational levels.

In contrast to research conducted by [20] who found an increase in the incidence of obesity linked to menorrhagia, our study divided the amount of blood loss during the menstrual cycle into three levels (heavy, light, and medium), none of which had a statistically significant association with BMI in different age groups. Another study by [21] found a strong correlation between waist to hip ratio and amount of blood loss, a novel association that requires further investigation. At the end, only one study supports our findings, which contrast with the majority of the research. That study was done in Malaysia in 2006 and showed that the BMI is not one of the factors linked to menstrual diseases including abnormal menstruation or heavy menstrual periods [22].

5. CONCLUSIONS

According to the results of this study, there is no relationship between the various body mass index (BMI) categories and irregular menstrual cycles. Our data also revealed that there is no connection between BMI and menstrual cycles including (duration, amount of blood loss and dysmenorrhea) or between BMI and age of the various groups.

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