

# Prevalence of Obesity and Impact of Menopause on It among Women of Rural Area of Punjab, Pakistan

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## ABSTRACT

Obesity is one of the major health public problems and it not only leads to serious and chronic diseases but also causes poor mental health. Although it is affected by number of factors including food, gender, socioeconomic status, and genetics but menopause is important in postmenopausal women. Therefore, this study was set to assess the prevalence of obesity and impact of menopause on it among women. This cross-sectional descriptive study was completed in about 3 months from August 2020 to October 2020 in a rural area of Punjab, Pakistan. 189 women were enrolled in our study according to agreed criteria of exclusion and inclusion. Women whose age was above 28 years and up to 58 years and who either had regular menstrual cycles or had cessation of menses from at least one last year were selected for study while women who either had irregular menstrual cycles or who were not willing to participate were excluded from study. Collection of data was accomplished via one self-structured proforma and WHO Classification of Weight Status which is based on BMI was also applied. Data analysis was carried out by using SPSS version 25. Multiple statistical tests including Chi-square test, Independent Sample t-test, and One-Way ANOVA test were used to assess the study variables. Overall, our current study shows high prevalence (29.6%) of obesity among women, however, mean of BMI value was higher among postmenopausal women (27.53 SD of  $\pm 4.28$ ) in comparison with premenopausal women (25.44 with SD of  $\pm 4.05$ ) which means that postmenopausal women had higher risk of development of Obesity in comparison with premenopausal women. The association between obesity and menopause was statistically significant ( $p=0.0001$ ). The difference of BMI mean value between premenopausal women and postmenopausal women was significant statistically ( $p=0.001$ ). Significance difference was also noted in BMI mean value of across four grades of weight status ( $p=0.000$ ). In a nutshell, overall prevalence of obesity is high among women and its even higher among postmenopausal women in comparison to premenopausal women which means menopause increases the obesity among women after menopause but process of development is so far vague.

**Keywords:** Prevalence, Obesity, Impact, Menopause, Population, Rural Area, Punjab, Pakistan.

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## I. INTRODUCTION

Body weight greater than normal is considered as obesity. Obesity is one of the major health problems around the world [1]. Obesity has already become a critical problem, in developed countries like United States of America with prevalence of 19.8% [2]. Likewise, Russia, European countries and Saudi Arabia have also reported high prevalence of obesity [3]-[5]. Besides, increased prevalence of obesity to censorious level, prevalence of obesity is still going up. And when we look towards prevalence in developing countries like Pakistan, obesity prevalence has reached to scaring level (27.85%) [1]. The rising prevalence of obesity not only causing severe physical diseases but also affecting psychologically because of ugly look and because of lack of interest in obese people by others. Obesity is not

merely known as root cause of all diseases, but it in reality leads to many lethal and consequential diseases. Fatal and chronic diseases that go hand in hand with obesity include heart failure, hypertension, coronary heart disease, type 2 diabetes mellitus, kidney disease and infertility [6]-[9]. Moreover, obesity can also even lead to certain cancers like of colon, prostate and endometrium, breast [10]-[13]. Therefore, obesity should be taken seriously, so that its fatal consequences can be avoided. Obesity is affected by number of factors. Fast food is one of key factors for obesity, consumption of fast food is directly related to development of obesity [14]. Different studies have reported that gender is also an important factor in causation of obesity and obesity is more prevalent among women [15], [16]. Lack of exercise, physical inactivity, and sedentary life styles also lead to obesity [17], [18]. Researches have also shown in the

development of obesity, genetic factors are also important [19]. Lower socioeconomic status is also a culprit for obesity development [20]. In old age women menopause also causes obesity in postmenopausal women [21]. As the factors in the development are different, so versatile strategies are required to deal obesity. From all above, mentioned factors that lead to obesity, in the lives of women one of the key factors and events, is menopause. Menopause is a phase of women during which obesity prevalence reaches to maximum [21], [22]. So, in this phase of life women should provide with specific measures to fight with principal cause of other diseases, which is obesity. Even though, worldwide many studies have been conducted to evaluate the effect of menopause on obesity [21]-[24]. Nevertheless, in Pakistan scanty amount of knowledge is present about the relationship between menopause and obesity in literature and almost no study is present at national level and particularly at local that could elaborate the influence of menopause on obesity. So, in the absence of study at national level, particularly at local level, and in the presence of studies at international level about menopause and obesity association, our study is set, to assess the prevalence of obesity among women and the impact of menopause on obesity development among women in rural area of (THQ) Tehsil Headquarter Hospital, Phalia, Punjab, Pakistan. If the results of current study shows that menopause influences obesity and influences positively then by execution of interventions and appropriate treatment of changes that occur in women after menopause and leads to obesity, we could be able to reduce obesity prevalence among postmenopausal women consequently, reduction in risk of other diseases for which obesity is principal cause to occur

## II. MATERIALS AND METHODS

### A. Study Design and Study Population

A descriptive cross-sectional study was conducted in the duration of around 3 months from August 2020 to October 2020 at rural area within the reach of (THQ) Tehsil Headquarter Hospital, Phalia, Punjab, Pakistan on general Population of women. 189 women were enrolled in our current study in accordance with set exclusion and inclusion criteria of study. Only those women whose age was from above 28 years to 58 years, and whose menstrual cycles were either regular or stopped since at least one last year were enrolled in the study whereas women whose menstrual cycles were irregular and who were not willing to participate were excluded from the study. Data collection was completed by utilizing one questionnaire that was self-structured proforma. After complete explanation of objectives of study informed consent was obtained from each recruited participant. Questionnaire was filled by interview of all participants

### B. Assessment of Demographic Details and Menopausal Status of Study Population

A Self-structured proforma was designed to acquire information about the demographic elements like age and menopausal status. Then height in meters and weight in kilograms were also measured. Their values were noted on self-structured proforma. On the basis of menopausal status of participants, they were divided into two groups including premenopausal (who had regular menstrual bleeding) and

postmenopausal (who had no menstrual bleeding since last one year).

### C. Assessment of Obesity

We used WHO Classification of Weight Status which is based on body mass index (BMI), to classify participants into various four groups Underweight (BMI= less than 18.5), Normal Weight (BMI=18.5 to 24.9), Overweight (BMI=25 to 29.9), and Obese (BMI= 30 and more than 30). BMI of each participants was calculated with help of height and weight. Weight in kilograms was divided by height in meters in squared. Height and weight were measured with measuring tape and weighing machine respectively. There measurements were noted on self-structured proforma.

### D. Data Analysis

Data analysis was carried out by using SPSS version 25. Chi square analysis was applied to assess the relationship between obesity and menopausal status. Difference in BMI across the menopausal status was evaluated using Independent sample t-test. One Way ANOVA test was applied to evaluate the difference of BMI across four grades of weight status. The value of p less than 0.05 was considered statistically significant.

## III. RESULTS

Our study population included 189 women, and on the basis of menopausal status of participants, 110(58.2%) women were at premenopausal stage of their lives whereas, 79(41.8%) women were at postmenopausal stage of their lives. Mean age of study population was 43.83 years with standard deviation (SD) of  $\pm 9.28$  and mean value of BMI for study population was 26.31 with SD of  $\pm 4.27$ .

Table I shows the percentages of different weight statuses based on BMI in all participant women and then separately among premenopausal women and postmenopausal women. It shows that obesity prevalence was higher among postmenopausal women as compared to premenopausal women. It also shows that weight status and menopause are associated significantly ( $p=0.0001$ ).

Table II indicates menopausal status-based variation in mean value of BMI along with results of independent sample t-test and this difference was significant ( $p=0.001$ ) statistically. Postmenopausal women had more mean BMI value as compared to premenopausal women, which means that they (Postmenopausal) were more obese or had over weight.

Table III elaborates the difference in mean value of BMI among various groups of participants based on their weight status. BMI mean value was highest among obese women and it was lowest among underweight women. This difference was also statistically significant among participants of various weight status levels ( $p=0.000$ ) which was checked by One-Way ANOVA test.

Results of our study show high Prevalence of obesity in postmenopausal women as compared to premenopausal women and high prevalence of overweight among premenopausal women in comparison to postmenopausal women. Although obesity prevalence was high overall.

TABLE I: POPULATION PARAMETERS ALONG WITH THEIR CROSS-TABULATION WITH STUDY VARIABLES AND CHI-SQUARE ANALYSIS

Cross-Tabulation and chi-square analysis					
Parameter	Weight Status		Over Weight	Obese	Chi-Square Analysis
	Underweight	Normal Weight			
Total=189	10 (5.3%)	45 (23.8%)	78(41.3%)	56(29.6%)	p-value
Menopausal Status	Premenopausal (n=110)	8 (7.27%)	29 (26.36%)	56 (50.90%)	0.0001
	Postmenopausal (n=79)	2 (2.55%)	16 (20.25%)	39 (27.84%)	

TABLE II: DIFFERENCE IN MEAN BMI VALUE ON THE BASIS OF MENOPAUSAL STATUS AND INDEPENDENT SAMPLE T-TEST ANALYSIS

Parameter		BMI Value	Independent Sample t-test
		Mean ( $\pm$ SD)	p-value
Menopausal status	Premenopausal	25.44( $\pm$ 4.05)	0.001
	Postmenopausal	27.53( $\pm$ 4.28)	

TABLE III: DIFFERENCE IN MEAN BMI VALUE BASED ON WEIGHT STATUS ALONG WITH ONE-WAY ANOVA ANALYSIS

Parameter		BMI Value	One-way ANOVA
		Mean $\pm$ SD	p-value
Weight Status	Under Weight	17.80( $\pm$ 0.421)	0.000
	Normal Weight	21.59 ( $\pm$ 1.51)	
	Over Weight	26.73 ( $\pm$ 1.73)	
	Obese	31.01 ( $\pm$ 1.23)	

#### IV. DISCUSSION

Obesity is a very notorious unhealthy condition because it leads to a great number chronic and fatal diseases. Our study provides important information regarding the effect of menopause on obesity development and prevalence of obesity among women of rural area of (THQ) Tehsil Headquarter Hospital, Phalia, Punjab, Pakistan. At the start of data analysis, first we estimated the prevalence of obesity among women and it was 29.6%. Another Pakistani study has reported lower prevalence (20.30%) of obesity among women as compared to our study [1]. An Indian study has reported higher prevalence of obesity (70.43%) among women in comparison to prevalence in our study [21]. Prevalence of obesity was higher among postmenopausal women (49.36%) as compared to premenopausal women (15.45%), After that we evaluate association between menopause and Weight status, and it was statistically significant ( $p=0.0001$ ). This significant link shows that menopause affects to obesity incidence among women after menopause. Different studies have reported similar results that obesity prevalence is higher among postmenopausal women [21], [24]. Even a study showed that highest prevalence of obesity in women occurs after menopause [22]. Then difference in BMI value between premenopausal women (25.44 with  $SD\pm 4.05$ ) and postmenopausal women (27.53 with  $SD\pm 4.28$ ) was assessed and difference was significant ( $p=0.001$ ) and it was assessed by applying Independent sample t-test. Mean BMI value among recruited women population was 26.31 with SD of  $\pm 4.27$ , Whereas another Pakistani study has reported 22.05 with SD of  $\pm 0.133$  BMI for women [1]. At the end of data analysis, we applied One-Way ANOVA test to check the significance of difference of BMI among four levels of weight status and it was significant ( $p=0.000$ ). Different reasons have been given for overall high prevalence of obesity among postmenopausal

women and two major of those include lack of estrogen and lack of physical activity [23]-[25]. Lack of estrogen after menopause leads to change in fat distribution and detrimental effects on body metabolism which bring further change in fat distribution and the because of fat distribution, obesity occurs. Similarly, lack of activity among women also leads to obesity. Women after menopause are almost aged and they do not go for regular exercise and moreover, they are less engaged in homes chores and outdoor activities as well. So, this could be the cause of obesity in postmenopausal women. Absolutely, our study may have some limitations because of cross sectional layout of it, yet our current study has brought an important health issue among postmenopausal women in high spot. This is first study in adjacent rural area of (THQ) Tehsil Headquarter Hospital, Phalia, Punjab, Pakistan that describes the impact of menopause on obesity along with its prevalence among women. Health related department of this area must make genuine efforts that could treat or reduce the higher prevalence of obesity among women after menopause. Diet modification, physical activity and hormone replacement therapy could be of prime importance in management of obesity in postmenopausal women. By treating and reducing, obesity we could not only make people strong mentally, but we could reduce risk of all diseases for which obesity is major culprit. According to our knowledge, at national and local level insufficient knowledge is present regarding factors that leads to increase obesity among postmenopausal women. So, further researches are required to fill this gap of knowledge regarding the factors that are the cause of obesity among women after menopause.

#### V. CONCLUSION

In summary, our current study shows high prevalence obesity among women. Moreover, obesity prevalence was even higher among postmenopausal women in comparison with premenopausal women. Postmenopausal women had higher mean value of BMI while premenopausal women had lower mean of BMI value and it clearly suggests that menopause leads to weight gain and obesity among women after menopause. Efficient and appropriate interventions and treatments are vital requirements for women to beat obesity and especially after menopause, so that in women obesity prevalence could be reduced and consequently decline in fatal diseases risk could be possible.

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