

## “Prevalence of Obesity Amongst Postmenopausal Women of Urban Pune, Maharashtra.”

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### ABSTRACT

**Background:** Obesity is one of the major health problems that has affected large number of people in the globe. At menopausal transition body composition changes. After attaining menopause the incidence and exacerbation of chronic health conditions associated with increasing age and obesity become more prevalent. However the prevalence of obesity in post menopausal women of urban Pune has not been studied previously.

**Purpose:** To determine the prevalence of obesity amongst post menopausal women of urban Pune, Maharashtra.

**Participants:** 30 post menopausal women, aged between 45 – 65 years, who attended menopause naturally were included.

**Methods:** After explaining the study procedure and obtaining consent from the participants, their height (in meters), weight (in Kilograms), waist circumference (in centimeters) and hip circumference (in centimeters) was measured. BMI and WHR were calculated appropriately.

**Analysis:** Mean, standard deviation and percentage were used for analysis of descriptive data of patients. Prevalence of obesity was calculated according to the values of BMI and WHR.

**Results:** According to Body Mass Index (BMI) the prevalence of obesity was 23.33% while according to waist hip ratio (WHR) the prevalence of central obesity was 76.7%

**Conclusion:** There is high prevalence of obesity (central obesity) in post menopausal women of urban Pune, Maharashtra .

**Implications:** Awareness should be created regarding post menopausal obesity and related health risks. Also preventive and curative strategies should be planned for peri-menopausal and post menopausal women.

**Keywords:** Postmenopausal obesity, BMI, WHR.

## BACKGROUND

Obesity is one of the major health conditions that has affected large number of people globally, leading to morbidity and mortality. The community, national and international health workers are alarmed by this global epidemic of obesity. Initially obesity was a problem in developed countries but now a days it is commonly seen in developing countries like India(1). The prevalence of obesity is rapidly increasing in India (2–5). due to changed dietary habits, physical inactivity and stress of modern life as a result of industrialization and urbanization.(6)

Obesity leads to various health problems like cardiac diseases, hypertension, diabetes mellitus, stroke, psychological disorders, etc. Obesity and these consequent health problems have a considerable economic impact on affected individuals not only personally but it also strains community health budgets at national and international levels(7).

Obesity has affected children, adolescents and adult males and females equally. However women are increased risk of weight gain at various physiological and psychological transitions like puberty, pregnancy and menopause. Additionally at menopausal transition there are overlapping changes occurring with advancing age. Post menopausal women are at an age when the incidence and exacerbation of chronic health conditions associated with obesity become more prevalent(8,9).

Menopause is defined as " Permanent cessation of menstruation at the end of reproductive life due to loss of ovarian follicular activity" (10) The menopause occurs at some time between the age of 45 – 55 years, with a mean of 50¾ years (11). The clinical diagnosis is confirmed after cessation of menstrual cycle for consecutive six months.

Post menopausal changes occur because the ovaries become exhausted of viable follicles; they shrink and fail to produce estrogen(10). The anterior pituitary gland is thus freed from cyclic inhibition of estrogen and continues to produce follicle stimulating hormone (FSH) and Luteinizing hormone (LH) (10).

Menopause leads to changes in various organs like shrinkage of ovaries, uterus, cervix and breasts, atrophy of fallopian tubes, uterine endometrium, cervix, vagina, vulva, breast tissue, epithelium of bladder and urethra, loss of tone of pelvic muscles. These all changes increase the risk of dysuria, incontinence and organ prolapse (10).

Along with all these organ changes, body composition also changes at menopausal transition (12). Decline in ovarian function leads to reduction in resting metabolic rate, gradual loss of muscle mass and strength (sarcopenia) and a relative increase in percentage body fat (mainly visceral) (13). In postmenopausal women the body composition changes from gynaecoid (pear shaped) to android (apple shaped) phenotype as their body has tendency to gain central obesity (14). These

changes are seen due to low estrogen levels which result in subcutaneous fat loss and visceral fat (fat located around the organs inside the abdomen) gain. The estradiol regulates fat cells around abdomen. At menopause reduction in estradiol level causes abdominal weight gain. The average weight gain at menopausal transition is about 2 – 4 kg (14,15).

Thus increase in total body fat and abdominal obesity in post menopausal women is not only because of aging but is also triggered by menopause and withdrawal of estrogen. After attaining menopause the incidence and exacerbation of chronic health conditions associated with increasing age and obesity become more prevalent. However the prevalence of obesity in post menopausal women of urban Pune has not been studied previously. Hence the purpose of the present study was to determine the prevalence of obesity in post menopausal women of urban Pune.

## MATERIALS AND METHODOLOGY

**Study design :** The present study was conducted in community setting among post menopausal women. 30 participants were selected using convenient sampling technique. The postmenopausal women, aged between 45 – 65 years, who attended menopause naturally were included. The women who attended menopause artificially were excluded from the study.

### Materials :

1. Measuring tape
2. Weighing scale
3. Pen
4. Chalk and scale to mark the height on the wall

### Outcome Measure :

#### 1. Body Mass Index (BMI) (13):

It is mostly used to classify underweight, overweight and obesity in adults in clinical practice. It is defined as weight in kilogram divided by square of the height in meter ( $\text{Kg}/\text{m}^2$ ).

The classification of BMI, is as follows(16) –

Classification	BMI ( $\text{Kg}/\text{m}^2$ )	Risk of co-morbidities
Underweight	< 18.5	Low
Normal Range	18.5 – 24.9	Average
Overweight (Pre-obese)	25.0 – 29.9	Mildly increased
Obese	$\geq 30.0$	
Class I	30.0 – 34.9	Moderate
Class II	35.0 – 39.9	Severe
Class III	$\geq 40.0$	Very severe

These values are same for men and women

## 2. Waist : Hip Ratio (WHR) (13):

It measures the ratio of waist circumference to hip circumference. Waist circumference is measured in centimetres at the level of navel and the hip circumference is measured in centimetres at widest part of hip. It is used to look at fat distribution of body. When WHR increases beyond a specific value, person is said to be overweight. High WHR also indicates abdominal fat accumulation. The values are as follows (17) –

Gender	WHR	Status
Men	>0.9	Overweight
Women	>0.85	Overweight

Health risk associated with WHR values (17) –

Health risk	WHR in Men	WHR in Women
Low	$\leq 0.9$	$\leq 0.80$
Moderate	0.95 – 1.0	0.81 – 0.85
High	$\geq 1.0$	$\geq 0.86$

## Methodology:

30 postmenopausal women were sampled, according to the inclusion criteria. The study procedure was explained to the participants. The demographic data and the informed, written consent of the participants was obtained from them and they were assured that the data will be kept confidential except as required by the law. For measuring the height the participants were asked to stand against the wall, the height was marked on the wall with the help of scale and chalk and measured with the help of measuring tape and recorded in centimeters. The weight measured using weighing scale and was recorded in kilograms. The waist circumference and hip circumference were measured using measuring tape and recorded in centimeters. BMI and WHR were calculated appropriately.

## Data Analysis:

The statistical analysis was done using R software. Mean, standard deviation and percentage were used for analysis of descriptive data of patients. Prevalence of obesity was calculated depending on the values of BMI and WHR.

## RESULTS

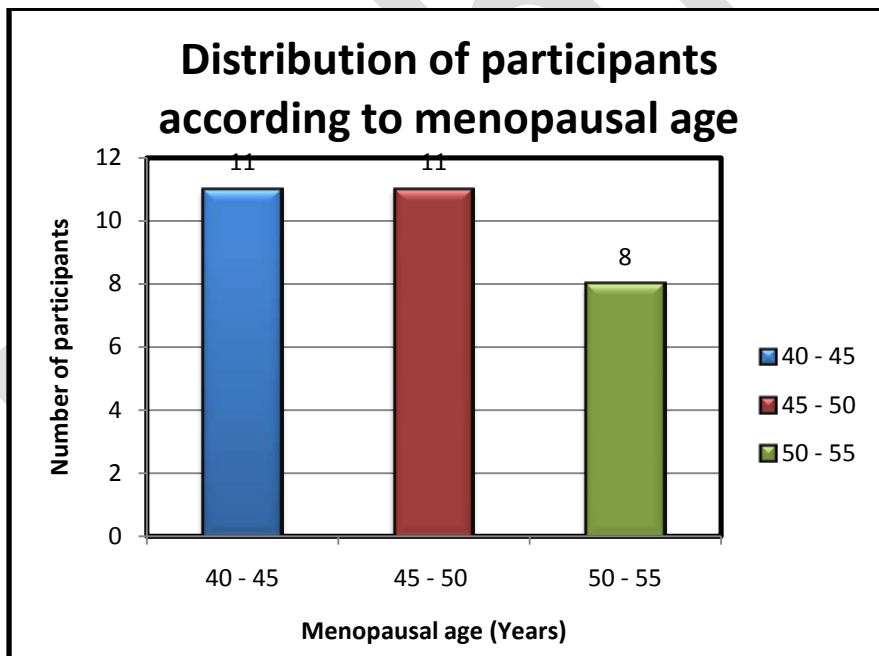
**Table 1: Demographic data of participants**

Number of participants	Mean age (years) ± S.D.	Mean menopausal age (Years) ± S.D.	Mean BMI (Kg/m <sup>2</sup> ) ± S.D.	Mean WHR ± S.D.
30	53.82 ± 4.96	47.10 ± 3.95	27.81 ± 3.95	0.90 ± 0.05

**Table 2 : Distribution of participants according to menopausal age**

Menopausal age	Number of participants	% of Participants
40 – 45	11	36.6
45 – 50	11	36.6
50 – 55	8	26.6

**Figure 1 : Distribution of participants according to menopausal age**

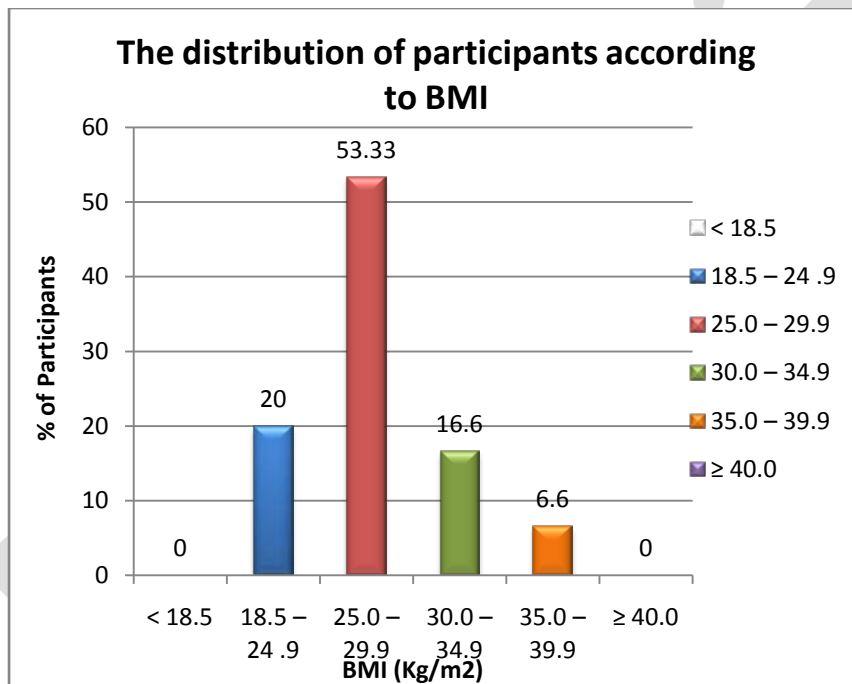


**Interpretation:** The above graph shows 36.6% women attended menopause within the age of 40 – 45 years, 36.6% women attended menopause within the age of 45 – 50 years and 26.6% women attended menopause within the age of 50 – 55 years.

**Table 3 : The distribution of participants according to BMI value and risk of co-morbidities**

BMI (Kg/m <sup>2</sup> )	Risk of co-morbidities	Number of Participants	% of Participants
< 18.5	Low (But risk of other clinical problems increased)	0	0
18.5 – 24 .9	Average	6	20
25.0 – 29.9	Mildly increased	16	53.33
30.0 – 34.9	Moderate	5	16.6
35.0 – 39.9	Severe	2	6.6
≥ 40.0	Very severe	0	0

**Figure 2 : The distribution of participants according to BMI value**

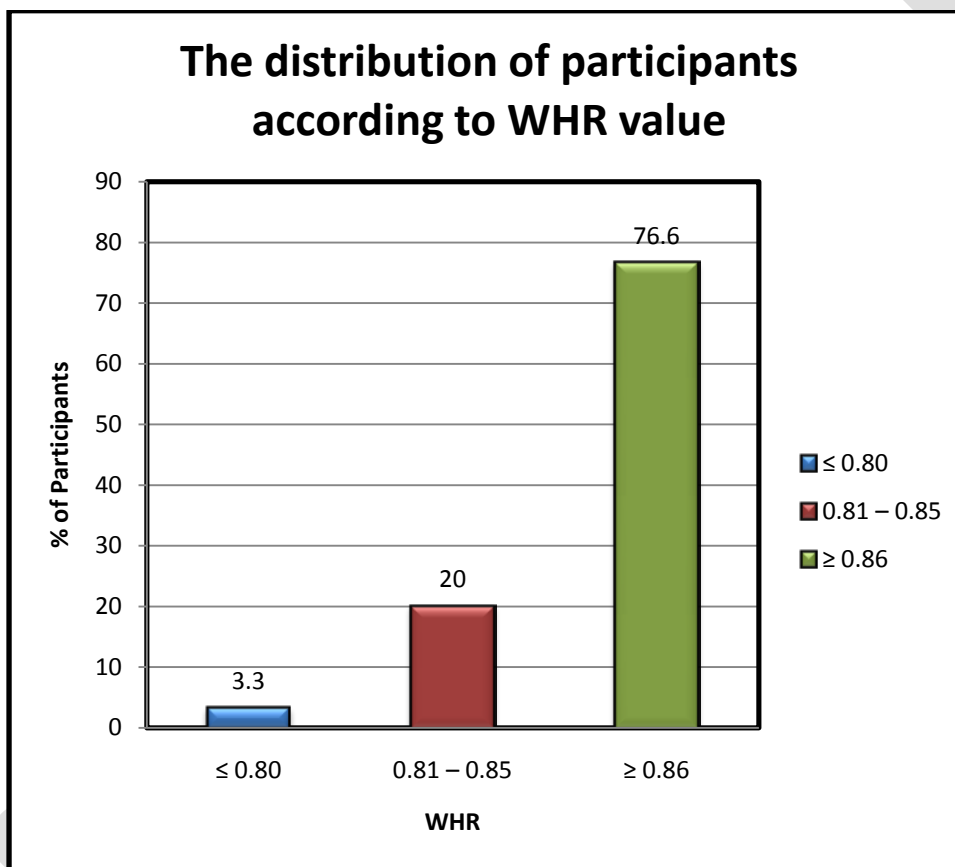


**Interpretation :** The above graph shows that 20 % women have BMI value within average range, 53.33% women are overweight and 23.33% women are obese.

**Table 4 : The distribution of participants according to WHR value and health risk**

WHR value	Health risk	Number of Participants	% of Participants
≤ 0.80	Low	1	3.3
0.81 – 0.85	Moderate	6	20
≥ 0.86	High	23	76.6

**Figure 3 : The distribution of participants according to WHR value**

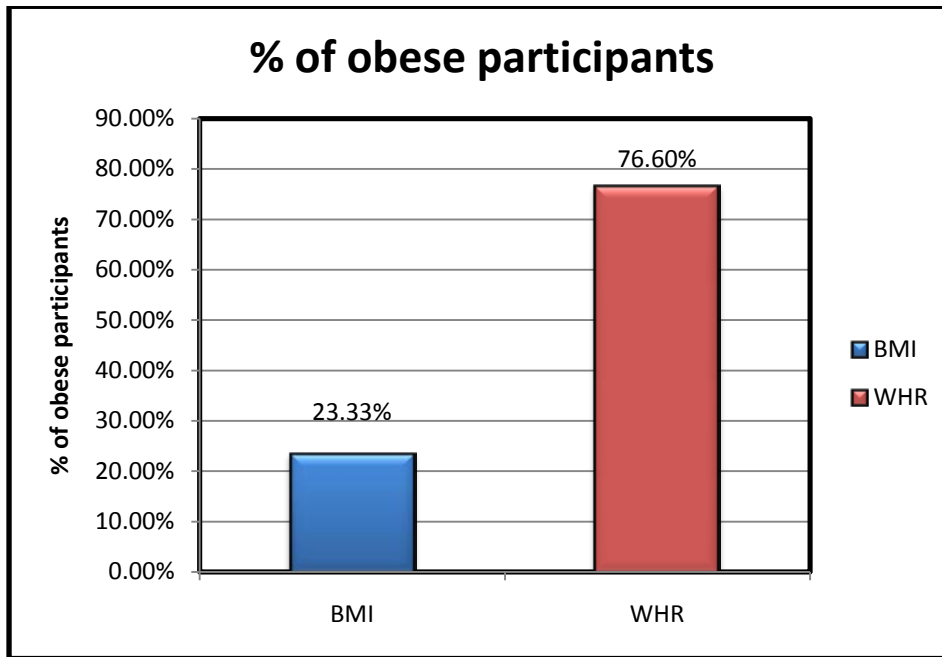


**Interpretation:** The above graph shows that 76.6% women were found to be overweight.

**Table 5: The prevalence of obesity according to BMI and WHR values**

Values	% of obese participants
BMI	23.33%
WHR	76.6%

**Figure 4: The prevalence of obesity according to BMI and WHR values**



## DISCUSSION

In this present study the average menopausal age was found to be 47.03 years. 36.6% women attended menopause within the age of 40 – 45 years, 36.6% women attended menopause within the age of 45 – 50 years and 26.6% women attended menopause within the age of 50 – 55 years. Thus women are at the risk of post menopausal obesity and related complications after the age of 40 years.

The BMI and WHR used in the present study are effective tools to classify obesity and to assess fat distribution in adults respectively (16,17).

The BMI values obtained from graphical analysis showed that the 20 % women have BMI value within average range, 53.33% women are overweight and 23.33% women are obese. Thus, 76% women are at increased risk of co-morbidities. This finding is consistent with a study by Kawaljit Kaur Khokhar et.al.(18), in which they found that the prevalence of obesity was 75.09% according to BMI value in postmenopausal women of Jalandhar District, Punjab. Another study by Sinha et.al (19) reported that the prevalence of obesity was observed to be high among rural Rajbanshi postmenopausal women of India aged 45-50 years (4.26%) and 50-56 years (18.91%).

The WHR values obtained from graphical analysis showed that, 76.6% women are found to be overweight. Thus, 76.6% women have central obesity and they are at high risk of developing cardio-vascular diseases. In the study by Kawaljit Kaur Khokhar et.al (18), in they found that the prevalence of obesity was 87.93% according to WHR values, in postmenopausal women of Jalandhar District, Punjab. In our study we also found that 20% women had moderate health risk even though their WHR was less than 0.86.



## CONCLUSION

The present study concluded that, 23.33% postmenopausal women were obese and 53.33% postmenopausal women were overweight, according to the BMI values while 76.6% postmenopausal women had central obesity according to WHR values. Thus, 76% postmenopausal women possess increased risk of health hazards and co-morbidities associated with obesity.

Awareness should be created amongst postmenopausal women about the obesity and related health risks and co-morbidities. Various strategies should be planned for community based rehabilitation of obese and overweight post menopausal women.

Awareness should be created amongst peri-menopausal women regarding post menopausal obesity and related health risks and co-morbidities. Various strategies should be planned for community based rehabilitation for prevention of postmenopausal obesity, thus reducing their risk of related health hazards and co-morbidities.

## ABBREVIATIONS

WHO – World Health Organization

BMI – Body Mass Index

WHR – Waist : Hip Ratio

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