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Obesity in post menopausal women of Punjab

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■ **ABSTRACT :** The present study was conducted to assess the prevalence of obesity by surveying 300 postmenopausal women in the age group of 45-60 years selected randomly from Punjab Agricultural University campus. The body mass index of the subjects was calculated on the basis of weight and height. The international classification (WHO, 2004) was used to assess the prevalence of obesity. The results revealed that mean age of menopause was 48.93±2.04 years. The prevalence rate of obesity was 25 per cent followed by overweight as 46 per cent and normal as 28 per cent. The prevalence of chronic diseases revealed that hypertension was the major risk factor (33%) followed by diabetes (26%) and hypercholesterolemia (13%). Obesity is the most prevalent risk factor in the post menopausal women hence, there is need to control obesity in this age group to stay healthy.

■ **KEY WORDS:** Chronic diseases, Obesity, Overweight, Post menopausal women

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Obesity is prevalent among all age groups and is on the rise among adults especially the women worldwide in both developed and developing countries (Wang and Hoy, 2004; Flegal, 2005). Obesity occurs more frequently in men than in women until 50 years of age. However, the percentage of obese women increases rapidly after 40 years and reaches a level similar to that found in males in the 50s (Tremollieres *et al.,* 1996) suggesting, menopause is one of the critical periods of a women's life during which weight gain and onset or worsening of obesity are favoured. At this period, prevalence of obesity is the highest (de Paz *et al.,* 2006; Sharma *et al.,* 2008). So, postmenopausal women have an increased tendency for gaining weight. Physiological withdrawal of estrogen brings about changes in fat distribution (Dubnov *et al.,* 2007) from a gynoid to an android pattern, reduced glucose tolerance, abnormal plasma lipids, increased blood pressure, increased sympathetic tone, endothelial dysfunction and vascular inflammation together with physical inactivity are probably the major cause of this phenomenon.

As a result, postmenopausal obesity compounds the situation leading to increased rates of hypertension, diabetes mellitus, coronary artery disease and mortality. There is general consensus that abdominal obesity is common in postmenopausal women. Additional consequences of obesity may include hormone-dependent cancer, gallstones, nephrolithiasis and osteoarthritis with increased mortality (Rosano *et al.,* 2007). Comparison of two major studies conducted by National Family Health Survey (NFHS-2) in 1998-1999 and NFHS-3 in 2005-2006 showed that prevalence of obesity among Indian women has elevated from 10.6 to 12.6 per cent (increased by 24.52 %). The prevalence is more profound in the women of age between 40-49 years (23.7%), residing in cities (23.5%) and households in the highest wealth quintile (30.5%). Highest percentage of obese women (29.9 %) is found in Punjab (Garg *et al.,* 2010). Therefore, the present study was conducted to assess the prevalence of obesity among the postmenopausal women in Ludhiana city of Punjab.

■ RESEARCH METHODS

Selection of subjects:

A sample of 300 postmenopausal women was randomly selected from campus of Punjab Agricultural University Ludhiana on the basis of following criteria:

–Female who were not having their menstrual periods for last 1 year.
–Age between 45 -60 years.
–Women who had not undergone hysterectomy or taken hormone replacement therapy (HRT).

Development of interview schedule:

The required data were collected through personal interview technique using pretested specially structured schedule. The data pertaining to age, caste, family type and educational level, religion and socio-economic status of the subjects and the family were collected. The menopausal age and suffering from any chronic disease were also recorded. Height and weight of all three hundred postmenopausal women were recorded and body mass index (BMI) was calculated as weight (kg) divided by height (m^2). The prevalence of obesity among postmenopausal women was assessed by using international classification of Body Mass Index (WHO, 2004).

Statistical analysis:

The data were analyzed by computation of descriptive statistical measures like percentage distribution, mean and standard deviation of the variables.

■ RESEARCH FINDINGS AND DISCUSSION

The experimental findings obtained from the present study have been discussed in following heads:

General profile:

The results (Table 1) revealed that of total sampled, post menopausal women, 42 per cent were in the age group of 50 to 55 years followed by 39 and 19 per cent in the age group of 45 to 50 years and 55 to 60 years, respectively. Sixty nine per cent of post menopausal women belonged to general category followed by backward class (20 %) and schedule caste (11 %). The distribution of the total subjects according to family type revealed that 60 per cent of subjects were having nuclear families followed by 40 per cent having joint families. Majority of the subjects (30 %) were educated upto matric followed by graduate (20%), primary (14 %) and post graduate (7 %). Of the 300 post menopausal women, 71 per cent were educated, supported by female literacy rate of Punjab (Census, 2011), 29 per cent of the subjects were assessed to be illiterate. The subjects belonged to mainly two religions *i.e.* Hinduism (63 %) and Sikhism (37 %).

Socio-economic status:

The data on socio-economic status of the subjects revealed that majority (74 %) were non- working and hence, were housewives, followed by 26 per cent subjects were engaged in some kind of work (Table 2). The findings on

Table1: General profile of the postmenopausal women (n=300)

Particulars	Post menopausal women
Age (years)	
45 - 50	118 (39.33)
50-55	125 (41.67)
55-60	57 (19.00)
Caste	
General	207 (69.00)
Backward class	61 (20.33)
SC	32 (10.67)
Family type	
Nuclear	181 (60.34)
Joint	119 (39.67)
Education level	
Illiterate	86 (28.67)
Primary	43 (14.33)
Upto matric	91 (30.34)
Graduate	60 (20.00)
Post graduate	20 (6.66)
Religion	
Hindu	190 (63.33)
Sikh	110 (36.67)

Values in parenthesis indicate percentages

Table 2: Socio- economic status of the postmenopausal women (n=300)

Particulars	Post menopausal women
Self occupation	
Non- working	223 (74.33)
Working	77 (25.67)
Self - income (Rs. per month)	
Upto 10,000	56 (18.77)
10,001 – 20,000	160 (53.25)
20,001 – 30,000	59 (19.78)
30,001 – 40,000	15 (4.90)
>40,000	10 (3.30)
Family occupation	
Service	245 (81.67)
Business	55 (18.33)
Family income (Rs. per month)	
Up to 20,000	141 (47.00)
20,001 – 30,000	120 (40.00)
30,001 – 40,000	28 (9.33)
> 40,000	11 (3.67)

Values in parenthesis indicate percentages

income level showed that more than half of working women (53 %) were having monthly income between Rs.10,001 to 20,000 per month followed by 20 per cent earning between Rs. 20,001 to 30,000. Only 5 and 3 per cent were earning between Rs. 30,000 to Rs. 40,000 and more than Rs. 40,000 per month, respectively. The main family occupation was service (82 %) followed by business (18 %). Forty seven per cent families were having monthly income up to Rs. 20,000 per month followed by 40 per cent of the subject's families were having monthly income from Rs. 20,001 to 30,000 per month. Only 9 and 4 per cent of the families were having monthly income between Rs. 30,001 to 40,000 and more than Rs. 40,000 per month, respectively.

Age of menopause:

The mean age of menopause was observed as 48.93 ± 2.04 years. Majority of the women (85 %) experienced menopause in the age group of 45-50 years followed by 15 per cent experienced menopause in the age group of 50 to 55 years (Table 3). The similar observations were reported by various studies like (Palacios *et al.,* 2010), who reported the average age of menopause in Asia from 42.1 to 49.5 years. The mean age of menopause of 500 postmenopausal women from rural areas of India was reported to be 49.35 years (Tandon *et al.,* 2010). The individual age at menopause showed variate from a lowest of 37.48 to highest of 53.59 years with a mean at menopause by 47.91±3.16 years in Punjab (Pathak and Parashar, 2010).

Table 3: Menopausal age of the postmenopausal women (n=300)

Menopausal age (years)	Frequency (%age)
45 – 50	26 (85.33)
50 – 55	44 (14.67)
Mean age of menopause	48.93 ± 2.04 years

Prevalence of obesity:

The results of the present study showed the mean body mass index of subjects as 27.37 ± 3.7 kg/m^2. The prevalence of obesity among postmenopausal women was found to be 25 per cent, whereas 46 per cent were overweight and 28 per cent normal (Table 4). Of the normal postmenopausal subjects, 56 per cent were identified in upper range of normal body mass index (BMI) *i.e.* 23-24.99 kg/m^2. Out of total overweight subjects, 58 per cent subjects were found in pre obese sub group with body mass index in the range of 25 to 27.49 kg/m^2, followed by 42 per cent in second sub group with body mass index in the range of 27.50 to 29.99 kg/m^2. Of the total obese postmenopausal subjects, majority *i.e.* 86 per cent was in obese I followed by 13 per cent in obese II and 1 per cent in obese III sub group. The prevalence of overweight and obesity among postmenopausal women of U.K. was reported to be 30-40 per cent and 25-31 per cent, respectively (WHO, 2006). The presence of overweight and obesity in 854 women in the age group of 30 to 56 years was reported to be 38 to 40 per cent and 20 to 22 per cent, respectively (Bhadra *et al.,* 2005).

Table 4: Distribution of subjects according to the prevalence of obesity (n=300)

Body mass index*(kg/m^2)	Frequency (%age)
Normal (18.50 -24.99)	85 (28.33)
18.50 - 22.99	37 (43.53)
23.00 - 24.99	48 (56.47)
Overweight (25.00 - 29.99)	139 (46.33)
Pre - obese (25.00 - 27.49)	80 (57.55)
27.50 - 29.99	59 (42.45)
Obese (>30.00)	76 (25.33)
Obese I (30.00 - 34.99)	65 (85.53)
Obese II (35.00 - 39.99)	10 (13.16)
Obese III (>40.00)	1 (1.32)

*WHO 2004

Prevalence of chronic diseases:

The results regarding the prevalence of chronic diseases related to obesity revealed that hypertension, diabetes and hypercholesterolemia were the major risk factors (Table 5). Fifty five per cent of the subjects were suffering from chronic diseases like hypertension, diabetes and cardio-vascular diseases. Of the subjects observed with the incidence of chronic risk factors, hypertension was the major risk factor present in 33 per cent of subjects followed by diabetes and hypercholesterolemia observed in 26 and 13 per cent of the subjects, respectively. The results were in line with (Tandon *et al.,* 2010) that reported the prevalence of hypertension as 55 per cent in rural postmenopausal women followed by 21 and 39 per cent of the subjects diagnosed with diabetes and dyslipidemia, respectively. Similarly the Framingham cohort demonstrated fourfold increase in the prevalence of cardio-vascular diseases in postmenopausal women. The prevalence of diabetes was reported to be 54.6 per cent in 2671 postmenopausal Korean women (Melby, 2005).

Table 5 : Prevalence of chronic diseases among the postmenopausal women (n=300)

Chronic diseases	
Prevalence	170 (56.33)
Type of chronic diseases *	Percentage (n = 170)
Hypertension	56 (32.67)
Diabetes	44 (25.67)
Hypercholesterolemia	22 (12.67)
Heart attack	0 (0.00)

*Multiple responses, Values in parenthesis indicate percentages

Conclusion:

The present study reveals close relationship between menopause and weight gain and onset and worsening of obesity among postmenopausal women. The results clearly indicated higher prevalence of overweight and obesity among postmenopausal women. Higher prevalence of obesity is associated with increased prevalence of chronic risk factors like hypertension, diabetes and hypercholesterolemia among postmenopausal women. Hence, there is a need for modification of dietary and physical activity pattern in this age group to stay healthy and free from risk factors of various chronic diseases.

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