

## Prevalence of Overweight and Obesity in Urban and Rural Women of Punjab

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### ABSTRACT

*A cross sectional study on 600 women (300 each belonging to urban and rural areas of Punjab) in the age range of 50-80 years is conducted with a view to explore the prevalence of overweight and obesity. For assessment of overweight and obesity the height, weight, waist circumference and hip circumference are taken on each subject using standard procedures. The prevalence rates are calculated according to the critical limits of body mass index (BMI) and waist hip ratio (WHR). Urban women of present study are found to be obese than their rural counterparts. Urban women have registered more waist circumference (96.25 cm) and hip circumference (95.58cm) than rural women, who have these parameters 88.87 cm and 89.05cm respectively. The mean values for BMI and waist hip ratio (WHR) are more for urban women (26.92 Kg/m<sup>2</sup> and 1.007 respectively). According to body mass index (BMI), the prevalence of grade-2-overweight and grade -3-overweight is 29.33%; 1% and 17%;0.66% in urban and rural women, respectively. Similarly the prevalence of central obesity according to waist hip ratio (WHR) cutoffs is 56.66% in urban and 47% in rural women. According to Snehathatha et al.,(2003) cut offs it is concluded that all women of urban and rural area of Punjab have central obesity.*

*Keywords: Body Mass Index, Waist- Hip ratio, Overweight, Obesity*

### INTRODUCTION

Obesity, defined either by increased waist circumference, waist hip ratio (WHR) and/or body mass index (BMI) is escalating rapidly worldwide. It has reached at an alarming rate (Flegal et al. 2002; Hedley et al. 2004) and prevalent among all age groups of adults especially in women in both developed and developing countries (Wang and Hoy, 2004; Flegal, 2005). The Healthy People 2010 report estimated that from 1988 to 1994, 23% of US adults aged 20 and older were

obese. Villamore et al.,(2006) described a large and rapid increase in the prevalence of obesity, from 3.6% to 9.1% during a 10-y period, in women attending antenatal clinics in an African urban setting. This epidemic has important public health consequences because obesity is associated with numerous diseases and disability (Visscher and Seidell, 2001) and shorter life expectancy (Olshansky et al., 2005). Obesity has a strong genetic background (Hebebrand et al., 2000), but many other factors such as changing standard of living, sedentary life styles, nutrition transition, socio-economic state also plays important role in prevalence of obesity (Shetty and Tedstone, 1997; WHO, 1998; Lathi-Koski et al.2002; Agarwal, 2004; Moli and Mini,2012). Paula (2001), found respondents living in poorer households were much more likely to be underweight than those living in households with higher socio-economic status. Much data is available on the prevalence of obesity worldwide (WHO MONICA Study, 1989; Boyle et al. 1994; Yanani et al. 1997; Flegal et al. 1998) and only limited data for South East Asian countries (Shetty and Tedstone, 1997; Mishra et al. 2007). India is also passing through such transitional phase of socio-economic development and nutritional status. Punjab is one of the economically advanced state of India and a greater penetration of industrialized life style and property. These transitions have contributed to increasing problem of overweight and obesity in Punjabi population especially women. Prevalence of overweight in urban areas is no doubt more than rural areas. But burden in rural areas is also substantial. Half of the countries surveyed had a  $\geq 20\%$  prevalence of overweight in their rural areas (Mendez et al., 2005 ). Therefore present study is undertaken among urban and rural Punjabi women in between 50-80 years of age to study the prevalence of overweight and obesity.

## **MATERIAL AND METHODS**

In this cross-sectional study, a total of 600 urban and rural women (300 of each group) of age 50-80 years were measured during the year 2010-2012 from urban and rural areas of Amritsar, Bathinda, Faridkot, Ferozepur, Ludhiana, Moga, Patiala, Shri Mukatsar Sahib districts of Punjab. All the subjects are of Punjabi origin, house wives, not physically disabled and have not gone through hysterectomy. The anthropometric measurements have been taken by following standard techniques recommended by Lohman et al., 1988. The measurements included height (cms), weight (kg), waist circumference (cms) and hip circumference (cms). Two adiposity indices, BMI (overall adiposity) and WHR (central adiposity) are calculated through following equations  

$$\text{BMI} = \frac{\text{Weight(kg)}}{(\text{Height in cm})^2}$$

WHR= Waist circumference (cm)/ Hip circumference (cm)

The suggested critical limits for BMI by WHO (2002) are utilized for the assessment of overweight.

Body Mass Index (BMI)	Grade
< 16	Grade-3-Thinness
16- 16.99	Grade-2-Thinness
17- 18.49	Grade-1-Thinness
18.5-22.99	NORMAL
23-29.99	Grade-1-Overweight
30-39.99	Grade-2-Overweight
≥ 40	Grade-3-Overweight

For assessment of central obesity cutoff values for WHR have been used by following Snehalatha et al., 2003 and Willet et al., 1999 are used.

WHR classification (Willet et al., 1999)

Waist-Hip Ratio (WHR)	Category
Less than equal to 0.95	Under weight
0.96-0.99	Normal
Greater than equal to 1.00	Over-weight

WHR Classification ( Snehalatha et al. 2003)

Category	Range
Normal	<0.81
Abdominal Obesity	>0.81

## RESULTS

The presented study has included 600 women (300 urban and 300 rural ). The mean and standard deviations of anthropometric variables and adiposity indices of the two groups are presented in Table 1. The results revealed that urban women have higher mean values for weight (63.06kg) ,

waist circumference (96.25cm), hip circumference (95.58cm) than rural women (60.72kg, 88.87 cm, 89.05 cm respectively). Values also reveals that rural women are taller than urban women. With regards to adiposity indices urban women have higher mean values for both BMI (26.92 kg/m<sup>2</sup>) and WHR (1.007) than mean values of BMI (25.46 kg/m<sup>2</sup>) and WHR (0.990) for rural women.

Table 1: Mean and standard deviation (S.D.) of anthropometric parameters and adiposity indices in Punjabi urban and rural women.

Parameters	Urban Women (n=300)		Rural Women (n=300)	
	Mean	SD	Mean	SD
Height (cm)	153.00	6.27	154.28	6.28
Weight (kg)	63.06	12.51	60.72	12.45
Waist Circumference (cm)	96.25	11.10	88.87	11.4
Hip Circumference (cm)	95.58	10.50	89.05	11.08
BMI (kg/m <sup>2</sup> )	26.92	5.03	25.46	4.7
WHR	1.007	0.04	0.99	0.03

The prevalence of overweight among the urban and rural women of Punjab is depicted in Table 2. Based on BMI cutoffs 45%, 29.33% and 1% women of urban area and 50.33%, 17%,0.66% of rural area lie under various grades of overweight. 21% urban women and 28.66% rural women are normal. Very few women from both categories lie under various grades of thinness.

Table 2. Percentage prevalence of overweight among urban and rural women of Punjab according to WHO classification (2002) of BMI.

Body Mass Index (BMI)	Grade	Urban women (n=300)	Rural women (n=300)
<16	Grade-3-Thinness	-	3 (1%)
16-16.99	Grade-2-Thinness	1(0.33%)	1(0.33%)
17-18.49	Grade-1-Thinness	10(3.33%)	6(2%)
18.5-22.99	NORMAL	63(21%)	86(28.66%)
23-29.99	Grade-1-Overweight	135(45%)	151(50.33%)
30-39.99	Grade-2-Overweight	88(29.33%)	51(17%)
≥40	Grade-3-Overweight	3(1%)	2(0.66%)

Table 3. Comparison of WHR status in rural and urban women according to WHR classification (Willet et al.1999).

Waist-Hip-Ratio (WHR)	Urban women (n=300)	Rural women (n=300)
0.95	23(7.66%)	31 (10.33%)
0.96-0.99	107(35.66%)	128(42.66%)
$\geq 1.00$	170(56.66%)	141(47%)

When cutoffs for WHR are considered according to Willet et al.,1999, 56.66% of urban and 47% rural women have values  $\geq 1.00$ . According to Snehalatha et al. 2003 there is no difference for WHR among urban and rural women.

## DISCUSSION

The present study reveals higher rate of overweight and obesity among urban women as compared to rural women according to BMI and WHR. On the other hand percent prevalence of various grades of thinness is quiet low i.e. 3.66% in urban and 3.33% in rural women. Mendez et al.(2005) also reported prevalence of overweight or obesity more in urban women than rural women. It is as twice as high in urban areas than rural areas. Gopinath et al. (1994) studied urban women of Delhi and reported prevalence rates of obesity as 33.4%. The Tanzania Demographic and Health Surveys conducted in 1991–1992 and 1996 reported prevalence rates of 4.1% and 6.0%, respectively, for women aged 15– 49 y who lived in urban areas (Martorell et al.2000). Reddy et al. (2002) found 40% and 36% prevalence of obesity in urban and rural women of New Delhi. The Nutrition Foundation of India also reported prevalence rate of overweight (BMI $\geq 25$ ) and obesity (BMI $>30$ ) as 50% and 40% respectively in urban Delhi (Gopalan,1998). Some studies also showed that obesity is more common among rural (20.4%) than urban adults (Patterson et al., 2004). In some of the most highly developed countries overweight exceeded 50% in urban and 40% in rural women ( Martinez-Gonzalez et al.1999; Visscher et al. 2002; Hedley et al. 2004). The prevalence of overweight and obesity in urban and rural women of Punjab as revealed from present study is no doubt less than what has been reported from highly developed countries.

**CONCLUSION:** The prevalence of overweight is 75.33% in urban and 67.99% in rural women. Similarly the incidence of abdominal adiposity according to WHR (Willet et al.,1999) is higher in urban women than rural women.. Whereas according to Snehalatha et al.(2003) this occurrence is 100% in both categories . The obesity trends are found to be higher in urban and rural women of Punjab.

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