



## Study on Prevalence of Overweight and Obesity Among Urban & Rural Area of Azamgarh

### KEYWORDS

Body Mass Index (BMI), Overweight, Obesity

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**ABSTRACT** The present study in prevalence of overweight and obesity among urban & rural subjects of Azamgarh, UP, India. Randomly selected 200 urban and 200 rural subjects. For the assessment of overweight and obesity, height and weight measurements were taken on each subject using the standard protocol given by Weiner and Lourie (1981). The practical and clinical definition of obesity is based on body mass index (BMI). The distribution of all subjects according to BMI classification (WHO, 1998). Out of 200 urban males, only 12 (6%) are underweight, 111 (55.5%) are normal and 47 (23.5%) are overweight while 21 (10.5%) are in obesity grade I, 6 (3%) in grade II and 3 (1.5%) are in obesity grade III. On the other hand, out of 200 rural males, 28 (14%) are undernourished and 118 (59.0%) are normal while 35 (17.5%) are overweight and 15 (7.5%) are in obesity grade I, 4 (2%) in grade II. This study showed an increasing in prevalence of overweight and obesity in urban subjects, calling for an urgent need for immediate and targeted preventive measures.

### Introduction:

The epidemic of childhood obesity is a substantial health burden worldwide<sup>1,2,3</sup> and its impact is being observed in developing countries as well<sup>4,5</sup>. However, the problem is of a larger magnitude in developing countries like India where a significant proportion of the population belongs to younger age group<sup>6</sup>. Rising prevalence of obesity in India may be attributed to various factors, like sedentary life style, unhealthy food habits, cultural practices and increasing affluence of middle class population<sup>7,8,9,10</sup>. As the pandemic of overweight and obesity around the globe continues to rise, many developing countries face a double burden of over nutrition and under nutrition (WHO/FAO, 2002)<sup>11</sup>. The scope and distribution of both types of malnutrition must be understood so that public health resources can be channelled appropriately. In recent years, India has controlled the problem of severe under nutrition to a substantial extent among young children but now facing a rising epidemic of overweight and obesity among children and adults. Only limited data on prevalence of overweight and obesity are available for adults in India. According to WHO (1998)<sup>12</sup>, there is a special need to collect good quality nationally representative prevalence data on obesity from countries, those are undergoing the so-called nutrition transition. India, especially the state of Uttar Pradesh, is also passing through such a transitional phase of socio-economic development which has the potential of altering the nutritional status of her population groups. Therefore, in the present study, an attempt has been made to investigate the prevalence of overweight and obesity in urban and rural subjects of Azamgarh.

### Material and Methods:

The present study was conducted in Department of Physiology, Government Medical College Azamgarh during the period from 2013 to 2014. Randomly selected 200 urban and 200 rural area subjects. For the assessment of overweight and obesity, height and weight measurements were taken on each subject using the standard protocol given by Weiner and Lourie (1981)<sup>13</sup>.

The practical and clinical definition of obesity is based on body mass index (BMI). Therefore, the value of BMI was calculated for each subject as follows:

$$\text{BMI} = \text{Weight (kg)} / \text{Height}^2 \text{ (m)}$$

The suggested critical limits of BMI by WHO (1998, 2000)<sup>12,14</sup> were utilised for the assessment of overweight and obesity.

**Table 1: shows critical limits of BMI by WHO (1998, 2000)**

WHO (1998)		WHO (2000)	
Classification	BMI (kg/M <sup>2</sup> )	Classification	BMI (kg/M <sup>2</sup> )
Underweight	<18.5	Underweight	<18.5
Normal	18.5-24.9	Normal	18.5-22.9
Overweight	25.0-29.9	Overweight	23.0-24.9
Obese Grades I	30.0-34.9	Obese Grades I	25.0-29.9
Obese Grades II	35.0-39.9	Obese Grades II	≥30.0
Obese Grades III	≥40.0	-	-

### Results and discussion:

The distribution of all subjects according to BMI classification (WHO, 1998). Out of 200 urban males, only 12 (6%) are underweight, 111 (55.5%) are normal and 47 (23.5%) are overweight while 21 (10.5%) are in obesity grade I, 6 (3%) in grade II and 3 (1.5%) are in obesity grade III. On the other hand, out of 200 rural males, 28 (14%) are undernourished and 118 (59.0%) are normal while 35 (17.5%) are overweight and 15 (7.5%) are in obesity grade I, 4 (2%) in grade II (Table 2). In other words, the overall combined prevalence of overweight and obesity in urban and rural males is 38.5% and 27.0%, respectively. It is also apparent from Table 2 that urban subjects show higher prevalence rate of overweight and obesity than rural subjects.

**Table 2: Classification of urban and rural subjects of Azamgarh according to WHO (1998) criteria of BMI:**

Nutritional status	Urban			Rural		
	BMI	N	%	BMI	N	%
Underweight	<18.5	12	6	<18.5	28	14
Normal	18.5-24.9	111	55.5	18.5-24.9	118	59
Overweight	25.0-29.9	47	23.5	25.0-29.9	35	17.5
Obeses Grades I	30.0-34.9	21	10.5	30.0-34.9	15	7.5
Obeses Grades II	35.0-39.9	6	3	35.0-39.9	4	2
Obeses Grades III	≥40.0	3	1.5	≥40.0	-	-

N= Number subject, %=Percentage

On using the lower cut-off values of BMI recommended by WHO (2000)<sup>14</sup> for Asians, percentage prevalence of overweight and obesity becomes 63.5% in urban subjects and 47.0% in rural subjects (Table 3). But, on the other hand, percentage prevalence of normal individuals decreases to 30.5% and 39.0% in urban and rural subjects respectively.

**Table 3: Classification of adult urban and rural subjects of Azamgarh according to WHO (2000) criteria of BMI**

Nutritional status	Urban			Rural		
	BMI	N	%	BMI	N	%
Underweight	<18.5	12	6	<18.5	28	14
Normal	18.5-22.9	61	30.5	18.5-22.9	78	39
Overweight	23.0-24.9	50	25	23.0-24.9	40	20
Obeses Grades I	25.0-29.9	47	10.5	25.0-29.9	35	7.5
Obeses Grades II	≥30.0	30	3	≥30.0	19	2

It is evident from the present study (Tables 2, 3) that the overall prevalence of overweight and obesity among subjects of Azamgarh, according to WHO (1998)<sup>12</sup> classification, is 32.75%, but according to WHO (2000)<sup>14</sup> classification it becomes 55.25%. The changed perception about body mass index (BMI) classification has drawn a drastic situation in this study. The prevalence of obesity in terms of number of people almost doubled according to new classification. This has not only of statistical significance but also is alarming for the health planners.

**Table 4: Comparison of prevalence of overweight and obesity in urban and rural subjects of Azamgarh:**

Area	N	WHO(1998)		WHO (2000)	
		N	%	N	%
Urban	200	77	38.8	127	63.5
Rural	200	54	27.0	94	47.0
total	400	131	32.75	221	55.25

**Table 5: The data on prevalence of overweight and obesity in various studies in India**

Reference	Place	Area	Obesity criteria of BMI	prevalence of overweight & obesity (%)
Sidhu and Sandhu (2005) <sup>15</sup>	Amritsar	Urban	≥23	51.5
Reddy et al. (2002) <sup>16</sup>	New Delhi	Urban Rural	>25	35.0 8.0

Shukla et al. (2002) <sup>17</sup>	Mumbai		>25	19.0
Mishra et al. (2002) <sup>18</sup>	New Delhi	Slum	>25	13.0
Zargar et al. (2000) <sup>19</sup>	Kashmir Valley	Combined	≥27	7.0
Gopalan (1998) <sup>20</sup>	Delhi	Combined	>25	29.2
Visweswara Rao (1995) <sup>21</sup>	Hyderabad	Urban Rural	≥30	2.1 0.8
Gopinath et al. (1994) <sup>22</sup>	Delhi	Combined	≥25	21.3
Present study Azamgarh	WHO (1998)	Urban Rural	≥25	38.8 27.0
	WHO (2000)	Urban Rural	≥23	63.5 47.0

Further, it is also observed from the present data (Table 4) that in terms of both the criteria (WHO, 1998, 2000<sup>12,14</sup>), urban subjects show high incidence of obesity (38.8% and 63.5%) than the rural ones (27.0% and 47.0%). Urban-rural differences in the prevalence of overweight and obesity are also evident in other parts of Asia (Ge, 1997; Martorell et al., 2000<sup>23</sup>; WHO/FAO, 2002)<sup>11</sup>. The possible reasons for higher rate of incidence among urban subjects might include the resultants of their sedentary lifestyle and changes in dietary practices. In urban Uttar Pradesh, the traditional diet of coarse grains and millets has given way to refined wheat and rice as the staple cereal, leading to a substantial reduction in fibre content and possibly micronutrients in diet. This shift has resulted in Uttar Pradesh urban affluent consuming more fat, oils and western-style fast foods. The variety of fast foods available in the market today has also contributed to the problem of obesity. This is coupled with physical activity and availability of advances in technology and transportation. As a result, there is a network of these factors which play an important role in the development of present state of obesity. On the other hand, rural subjects of the present sample are mainly engaged in manual labour and fairly high level of physical activity. But now-a-days, labour-saving devices have eliminated many of the back-breaking tasks of agricultural and industrial sector occupations and reduced the time it takes to complete them. That is why the present sample shows higher prevalence of overweight and obesity in rural subjects than the other rural populations of India. The underweight prevalence in the present sample is about three times higher in rural areas than in urban areas.

**Conclusion:**

These findings suggest that the overall prevalence of overweight and obesity in urban and rural subjects is 63.5% and 47.0%, respectively, according to new classification of BMI. This study showed an increasing in prevalence of overweight and obesity in urban subjects, calling for an urgent need for immediate and targeted preventive measures. Therefore, multicentric approaches and research are needed with reference to this epidemic in those subjects which are undergoing such nutritional transition.

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