



SCREENING FOR OBESITY IN A RURAL COMMUNITY RELEVANCE OF INDICES

Community Medicine

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ABSTRACT

BACKGROUND: Obesity is a fast growing problem in the developing countries like India and is now known to be associated with increased health risk. Realizing the fact that the obesity in adolescent age group does not receive the deserved attention in the prevention and control programme, the present study was undertaken on 1342 subjects study.

Objective: 1. To study the prevalence of overweight and obesity in study population. 2. To find the association of body mass index (BMI) with important parameters like body fat and waist circumference.

METHODOLOGY: It was a cross sectional observational study. The study population comprised of individual of either sex over 15 years of age. The estimated sample size for present study is 1342. The subjects were screened by body mass index, waist circumference and body fat.

RESULTS: The prevalence of obese as per WHO classification was 4.6% (Male-2.5%, Female-6.2%) whereas; prevalence of obese was 17.6% (Male-11.1%, Female-22.3%) as per Asia classification. The sensitivity and specificity of BMI was found to be 42.4% and 99.3% respectively. However, the sensitivity and specificity of WC was observed to be 80.8% and 91.6% respectively.

CONCLUSION: The prevalence of overweight and obesity is high among people in rural areas in Barabanki

KEYWORDS

Obesity; BMI; Waist circumference; Body fat.

INTRODUCTION:

Obesity defined as excess of body fat, frequently results in a significant impairment of health. Obesity is the result of increase in size or number of fat cells in the body. Worldwide obesity has nearly doubled since 1980. In 2008, more than 1.4 billion adults, 20 years & older, were overweight. Of these, over 200 million men and nearly 300 million women were obese. 35% of adults aged 20 and over were overweight in 2008, and 11% were obese. 65% of the world's population lives in countries where overweight and obesity kills more people as compared to being underweight. More than 40 million children under the age of five were overweight in 2011. About 20% of children and adolescents are overweight, and a third of these are obese, (Elizabeth et al 2005)

National Family Health Survey NFHS-I NFHS-II, India, observed that the prevalence of both overweight and obesity increases in each age group from 15 years of age to 49 years. NFHS-III (2005-06), the prevalence of overweight (BMI ≥ 25 kg/m²) and obesity (BMI ≥ 30 kg/m²) among Indian females as estimated from 15 years to 49 years of age were 12.6% and 2.8% respectively. In the Indian Women's Health Study 16 the overall prevalence of central obesity among women between 25-64 yr ages was 55 percent. Anthropometric measurements are used in epidemiologic studies, as indirect methods to estimate the size of fat mass. The most commonly used of these measurements are stature (height), weight and skinfold thickness measurements and waist circumference and waist to hip ratio, (Power et al 1997).

Obesity is now a public health problem but exact prevalence of it is still not known especially in rural populations of different regions in the country. Hence the present study was undertaken to assess the prevalence of obesity and its associated factors in the rural area of Barabanki district in UP.

MATERIALS AND METHODS:

Study Design: Community based cross-sectional study.

Study Setting: This study was conducted in the villages around Rural Health Training Centre (RHTC), Satrikh, Barabanki District U.P.

Study population: The study population comprised of individual of either sex over 15 years of age.

Sample Size: The Sample of 1342 was calculated taking into account the prevalence of obesity as 14% as reported by (Chauhan et al, 2015), the prevalence of obesity was found to be 14%. The relative precision

was taken as 20%. Multistage sampling sampling was used for enrolling the sampling unit.

Data Management: A pretested questionnaire was adopted after a short pilot study after availing informed consent. Height and weight of each individual was measured with the help of fiber plastic measuring tape up to the nearest millimeters and weighing scale up to the 0.5 kg respectively. Body mass index was calculated by dividing the weight in kilogram by square of height in meter. Waist circumference and hip circumference was measured using fiber plastic tape up to the nearest millimeter. The waist circumference of >102 cm for males and >88 cm for females was considered an indicator of abdominal obesity.

RESULTS:

More than one third (42.3%) of the subjects were males. About one fifth of the subjects were between 25-34 (22.7%) and 35-44 (20.9%) years. The percentage of male subjects was found to be lower in all the groups than females except ≥ 65 years. In the present study, a total of 1342 individuals were analysed. The majority of the studied population were Hindu (89%) followed by Muslims (11%). The percentage of OBCs (62.2%) was found to be higher than SC/ST (28.7%) and general caste (9.1%). Majority of the subjects were married (71.8%) followed by unmarried (22.4%) and widowed/widower (5.9%). Overall, 60.9% of the respondents were literate, of whom 70.7% were males and 53.7% were females. More than one third (36.4%) of the respondents were Educated up to middle class, of whom 41.4% were male and 31.5% were females. Overall, 46.1% of the respondents were housewife. More than one third (20.4%) of the respondents were involved in farming, of whom 45.9% were male and 1.8% were females. The prevalence of obese as per WHO classification was 4.6% (Male-2.5%, Female-6.2%) whereas, prevalence of obese was 17.6% (Male-11.1%, Female-22.3%) as per Asia classification. The abdominal obesity was observed to be 15.1% being higher in females (23.4%) than males (3.9%). The obesity was 9.3% as per body fat (Male-5.5%, Female-12.1%). [Table no 1]

The sensitivity and specificity of BMI was found to be 42.4% and 99.3% respectively. However, the sensitivity and specificity of WC was observed to be 80.8% and 91.6% respectively. [Table 2]

DISCUSSION:

In the present study, the prevalence of obesity as per BMI was found to be 4.6% being higher among females (6.2) compared to males (2.5%). The prevalence of obesity is almost similar with the other studies

conducted in the rural population (NFHS-III, 2005-06; Mishra et al, 2009; Rao, 2011; Shirazi, 2014; Chauhan et al, 2015). However, some other studies have shown the higher prevalence of obesity in the rural population (NNMB, 2004-05; Mathur et al, 2005; Bhardwaj et al, 2011; Gothankar et al, 2011; Sen et al, 2013; Kumar et al, 2014; Srivastava et al, 2015). In addition, Singh et al (2015) study has been reported lower prevalence of obesity than the present study. In the present study, the overall prevalence of abdominal obesity as per waist circumference was 15.1% being much higher among females (23.4%) compared to males (3.9%). Now days, high emphasis has been placed on only body fat due to the increasing prevalence and adverse medical, economic and psychosocial consequences of obesity. Most of the methods used to measure body fat rely on anthropometric variables. This is because height and weight are variables readily available and easy to measure. Many research works have proven this method to be an ineffective method of estimating body fat percentage since it fails to differentiate between fat mass and fat free mass (Riazi et al, 2010; Cintra et al, 2013; Nikolaidis, 2013; Schroder et al, 2014). In the present study, the prevalence of obesity as per body fat was observed to be 9.3%. The prevalence of obesity as per body fat was among 5.5% of male and 12.1% of females. It has also been noted that for a given BMI, Asians have higher body fat percentage compared with Caucasians (Ramachandran and Snehalatha, 2009). In this study, the prevalence of obesity was found to be higher among the age group of 35-44 (8.9%) years than other age groups. Kumar et al (2014) found the prevalence of overweight and obesity increased with advancing age, maximum being in age group 50-59 years (22.2%). The prevalence of obesity was reported to be 24.1% in age group 30-39 by Rao et al (2011). In this study, there was no significant ($p > 0.05$) association between education and prevalence of obesity. (Rao et al, 2011) and (Singh et al, 2015) have also reported almost similar findings. In our present study the prevalence of obesity was maximum in married (17.9%). Similar finding were observed in (Kumar S et al, 2014) they observed the prevalence of overweight was maximum in married persons (18.9%) followed by widowed/separated persons. In the present study, the prevalence of obesity was found to be significantly higher among shopkeepers (12.5%) compared to other occupational groups (OR=21.0, 95%CI=1.18-371.72, $p=0.03$) which was similar the study by (Rao et al, 2011) and (Singh et al, 2015).

CONCLUSION:

The prevalence of obesity as per BMI (WHO classification) was observed to be 4.6%. The prevalence of obesity was 6.2% among females and 2.5% among males. The prevalence of obesity was found to be significantly higher among females (6.2%) compared to males (2.5%).

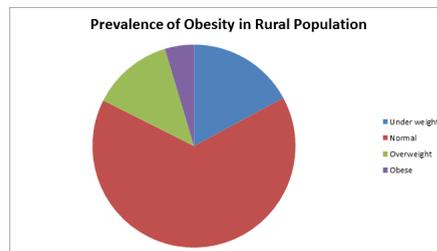
The prevalence of obesity was found to be significantly higher among shopkeepers (12.5%) compared to other occupational groups. Sensitization and awareness about obesity & its adverse effects through existing media such as TV, Radio etc should be undertaken so that families can build up a healthy life style which includes a balanced diet and regular physical activity. ANM/ASHA's and other health care field workers (Anganwadi) under CHC (Satrikh), be oriented and sensitized regarding obesity and associated morbidities through regular periodic orientation programmes organised with the help of medical officer in the field practice area including training for basic anthropometric measurements (BMI & WC).

Table no. 1 Bio-social characteristic of the study population. (N=1342)

Age in years	Obese		Non-Obese		Chi-square	P-Value	
	No.	%	No.	%			
15-44	783	32	4.0	751	96.0	1.212	0.2701
45 and above	559	30	5.4	529	94.6		
Sex							
Male	567	14	2.5	553	97.5	10.307	0.0013
Female	775	48	6.2	727	93.8		
Education							
Illiterate	525	28	5.3	497	94.7	0.996	0.3182
Literate	817	34	4.2	783	95.8		
Occupation							
Unemployed	766	41	5.3	725	94.7	2.173	0.1404
Employed	576	21	3.6	555	96.4		

Table-2: Predictive value of BMI and WC in determining obesity as Body Fat being gold standard

Variables for Obesity	Body fat			Sensitivity	Specificity	
	Obese	Non-obese	Total			
BMI					42.4%	99.3%
Obese	53	9	62			
Non-obese	72	1208	1280			
Total	125	1217	1342			
WC					80.8%	91.6%
Obese	101	102	203			
Non-obese	24	1115	1139			
Total	125	1217	1342			



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