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Dhara Prajapati
Community Medicine Department, B.J. Medical College, Ahmedabad, Gujarat

Correspondence:
Dhara Prajapati
Community Medicine Department, B.J. Medical College, Ahmedabad, Gujarat

Prevalence of Obesity among Staff of Tertiary Care Hospital and Medical College in Ahmedabad

Dhara Prajapati

Abstract
Background: Obesity is emerging as a global epidemic with growing threat to health in both developed and developing countries. Obesity and overweight are abnormal conditions in which weight gain has reached the point where it poses significant risk to health. This study seeks to determine the prevalence of obesity in a tertiary care hospital staff.
Methods: A cross sectional study was undertaken in a urban area of Ahmedabad. Randomly selected 600 employees of B.J. Medical College and Civil Hospital were interviewed using predesigned pretested questionnaire. Physical measurements of subjects were measured and the body mass index calculated.
Results: obesity was seen in 47.67% males and 49.00% females with the criteria of BMI ≥25 kg/m^2.71.67% females and 46.67% males were found to have central obesity.
Conclusion: there was no gender wise significant different for obesity prevalence with the criteria of BMI ≥25 kg/m^2.There was a positive correlation between BMI and waist circumference.

Keywords: Obesity, Tertiary Care Hospital, Body Mass Index, Waist Circumference

1. Introduction
The obesity can be defined simply as the disease in which excess body fat has accumulated to such an extent that health may be adversely affected. This excessive fat build up results from an imbalance between calories consumed on one hand and calories expended on the other hand [1]. Obese individuals are therefore predisposed to adverse health conditions such as cardiovascular diseases, type 2 diabetes mellitus, osteoarthritis and cancers [2, 3].
Obesity may be classified as generalized obesity or central obesity. In adults, the body mass index (BMI) is used as a measure of generalized obesity while waist circumference (WC) and waist to hip ratio are measures of central obesity. The BMI is calculated by dividing the weight in kilograms by the square of the height in meters [4]. The WHO classifies a BMI of 25kg/m^2 – 29.9kg/m^2 as overweight while that of 30kg/m^2 and above is classified as obese.[5]A BMI of 40kg/m^2 and above is classified as morbid obesity [5].
According to the National Family Health Survey-3 (NFHS-3) in India, overweight and obesity are three times higher in urban areas than in rural areas and are more common among women [6]. Studies say that India will become the global diabetes capital by 2050 if the abdominal and lower limb obesity and metabolic syndrome are not arrested. Researches over the last several years have shown that Indian bodies and genetics are different from their western counterparts. Indians suffer from abdominal obesity compared to people in the west whose bodies are uniformly obese. The country's new diagnostic cut-off for the body mass index is 23 kg/m^2 as opposed to 25 kg/m^2 globally.
The prevalence of overweight and obesity and the co-morbidities associated with them are well documented in developed countries. However the same cannot be said of developing countries. Obesity leads to increase in morbidity and mortality worldwide and it is important to have good understanding of the burden and distribution of the disease in our environment. More so it is necessary to assess the prevalence of overweight and obesity in a tertiary institution to see whether the nutritional transition has caught up with them as they are expected to know better than the rest of the society. This study sought to determine the prevalence of overweight and obesity in staff of tertiary care Hospital and Medical College in Ahmedabad.

2. Materials and methods
2.1 Study setting
The present study was conducted in urban settings of Ahmedabad. Total 300 males and 300 females were selected from employees of B.J. Medical College and Civil Hospital, Ahmedabad working as Class III and class IV employees. Individual aged 25-60 years were included due to

age of retirement is 58 years and 60 years in class III and class IV government employees respectively. In the pilot study the prevalence of obesity (BMI > 25kg/m^2) among class III and class IV government employees was found to be 45%. Considering this prevalence sample size was calculated with the help of formula

Sample size n = 4pq/L^2

Allowable error L was taken 10%.
Calculated sample size was 488 but for the convenience of study, the sample size was decided to be 600.

2.2 Study Period: The study was carried out from January 2013 to November 2014.

Study Design: Cross sectional study.

2.3 Data collection: A pre designed and pre tested Questionnaire was used to collect demographic details. Height, weight and waist-circumference were measured. Physical measurement, such as height and weight, was recorded to calculate BMI (kg/m^2) and waist-circumference (WC) was recorded to calculate Waist Hip Ratio (WHR). For measuring weight, the subject was asked to stand upright on the weighing scale bare footed and weight was recorded to the nearest 0.5 kg. For measuring height, the subject was made to stand erect looking straight on a level surface with heels together and toes apart without shoes. Height was recorded to the nearest 0.5 cm. Waist circumference was measured with the subject in standing position using a non-elastic plastic tape midway between the lower rib margin and the iliac crest to the nearest 1 mm. Hip Circumference was measured around the widest portion of the buttocks.

2.4 Data analysis: Data entry was done in Microsoft Excel and Data were analyzed using Epi Info software (7.1.0.6).

3. Results

Table 1: Socio-demographic profile of the study population (n=600)

	Male (n=300) No. (%)	Female (n=300) No. (%)
Age(Yrs.)		
25-34	84(28)	74(24.67)
35-44	53(17.67)	57(19)
45-54	106(35.33)	104(34.67)
≥55	57(19)	65(21.67)
Type of family		
Joint	195(65)	205(68.33)
Nuclear	105(35)	95(31.67)
Religion		
Hindu	283(94.33)	288(96)
Muslim	15(5)	8(2.67)
Christian	2(0.67)	4(1.33)
Marital status		
Single	26(8.67)	24(8)
Married	274(91.33)	240(80)
Widow/widower	0(0)	36(12)
Education		
Illiterate	2(0.67)	39(13)
Primary	45(15)	72(24)
Secondary	64(21.33)	42(14)
Higher secondary	69(23)	12(4)
Diploma	6(2)	36(12)
Graduate	106(35.33)	75(25)
Post graduate	8(2.67)	24(8)

In total 600 subjects, 150 (25%) males and 150 (25%) females were taken from class III and 150 (25%) males and 150(25%) females were taken from class IV employees. Mean age was 43.60±11.06 years in males and 43.50±10.59 years in females (p >0.05). Majority of participants belonged to joint family, Hindu and married. (Table-1).
Among 150 class III male employees, 120 (80.00%) were clerks and 22 (14.66%) were lab technicians. Among 150 class III female employees, 70 (46.66%) were clerks, 53 (35.33%) were nurses and 16 (10.66%) were lab technicians.

Table: 2 Information regarding physical measurements

	Male(n=300) Mean ± SD	Female(n=300) Mean ± SD	Test of significant
Weight (kg)	66.03±9.17	58.09±10.29	z=9.97, p<0.05
Height(m)	1.62±0.08	1.51±0.07	z=17.92, p<0.05
BMI (kg/m^2)	25.30±3.42	25.37±4.55	z= -0.21, p>0.05
Waist Circumference(cm)	87.39±7.79	85.14±10.88	
Waist Hip Ratio	0.95±0.03	0.95±0.04	

Based on physical measurements of studied population, there was a gender wise significant difference found in mean value of weight and height. There was no gender wise difference in mean value of BMI. Mean value of waist circumference in males was 87.39±7.79 and in females was 85.14±10.88. Mean value of Waist- Hip Ratio in males was 0.95±0.03 and in females was 0.95±0.04 (Table- 2).

Table 3: Details of BMI in studied population

BMI* (kg/m^2)	Male (n=300) No. (%)	Female (n=300) No. (%)
< 18.5	4(1.33)	12(4.00)
18.5 - 22.99	87(29.00)	93(31.00)
23- 24.99	66(22.00)	48(16.00)
25-27.49	48(16.00)	48(16.00)
27.5-29.99	69(23.00)	52(17.33)
30-34.99	24(8.00)	37(12.33)
35-39.9	2(0.67)	9(3.00)
>40	0(0.00)	1(0.33)

*χ2=0.107, p>0.05 for male and female comparison for BMI cut off >25 kg/m^2

BMI of the study subjects was classified according to two different classifications namely, WHO classification and the classification recommended for Asia-Pacific population. In present study, obesity was seen in 143(47.67%) males and 147(49.00%) females with the criteria of BMI ≥25 kg/m^2 and there was no gender wise significant different for obesity prevalence (p>0.05) (Table-3).
Among males, prevalence of obesity (59.64%) was higher in age group of 55 years and above and lower (25.00%) in 25-35 years of age group. Among total 300 males, 143 (47.67%) had BMI > 25 kg/m^2. Among females, prevalence of underweight in 25-34 years of age group was 13.51% and 40.54 % females had normal BMI. In 35-44 years of age group 52.63% females and 45-54 years of age group 55.78% were obese. 61.54% females were obese in 55-64 years of age group.(Table-4).

Table 4: Age Group Wise BMI in study population

Age (yrs.)	BMI in kg/m² (Males n=300)				
	Underweight <18.5 No. (%)	**Normal 18.5-22.99 No. (%)**	**Overweight 23-24.99 No. (%)**	**Obese >25 No. (%)**	**Total No. (%)**
25-34	4(4.76)	43 (51.19)	16(19.04)	21(25.00)	84
35-44	0(0.00)	13(24.53)	11(20.75)	29(54.72)	53
45-54	0(0.00)	24(22.64)	23(21.69)	59(55.66)	106
≥55	0(0.00)	7(12.28)	16(28.07)	34(59.64)	57
Total	4(1.33)	87(29.00)	66(22.00)	143(47.67)	300
	BMI in kg/m² (Females n=300)				
25-34	10(13.51)	30(40.54)	15(20.27)	19(25.67)	74
35-44	0(0.00)	20(35.09)	7(12.28)	30(52.63)	57
45-54	0(0.00)	26(25.00)	20(19.23)	58(55.78)	104
≥55	2(3.08)	17(26.15)	6(9.23)	40(61.54)	65
Total	12(4.00)	93(31.00)	48(16.00)	147(49.00)	300

Table 5: Details of Waist Circumference and Waist Hip Ratio

	Male (n=300) No. (%)		**Female (n=300) No. (%)**	
Waist Circumference*	< 90 cm >90 cm	160(53.33) 140(46.67)	< 80 cm >80 cm	85(28.33) 215(71.67)
Waist Hip Ratio**	< 0.9 >0.9	20(6.67) 280(93.33)	< 0.8 >0.8	17(5.67) 283(94.33)

(*χ^2=38.80, p <0.05 for waist circumference gender wise comparison,
**χ^2=0.25, p>0.05 for Waist Hip Ratio gender wise comparison)

Among 300 males, 140(46.67%) had waist circumference more than 90 cm. Among 300 females, 215 (71.67%) had more than 80 cm waist circumference. In 280 (93.33%) male employees had waist Hip ratio more than 0.9. In females, 283(94.33%) employees had Waist Hip Ratio more than 0.8
Figure-1 shows there was a positive correlation between BMI and waist circumference. As value of BMI increased value of waist circumference increased and vice versa.

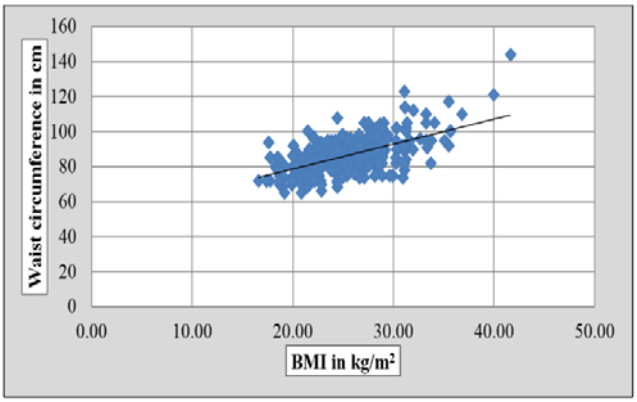

Fig 1: Scatter plot between BMI and waist circumference

4. Discussion

A total of 600 employees were included as study participants. Both males and females constituted 50% of the sample. Age of employees ranged from 25–60 years with mean age of females was 43.50±10.59 years and that of males was 43.60±11.06 years.
In present study, obesity was seen in 47.67% males and 49% females with the criteria of BMI ≥25 kg/m² (Table 3). In a study done in Dehradun, by Saxena *et al.*, [7] prevalence of obesity (BMI >25 kg/m²) was 9.5 % in males and 18.9 % in females. Another study done by Anuradha R. *et al.*, [8] prevalence of obesity was 19.8% in urban slum women in Chennai. The prevalence of obesity in the study of Nigeria was 9.1% and that of overweight was 26.2%. It was more prevalent in females than males and also more prevalent in the younger age group than the older age group [9].
In present study, 46.67% males and 71.67% females were found to have high waist circumference. Also, 93.33% males and 94.33% females had high waist-hip ratio (Table 5). On the contrary, Mehan *et al.*, [10] reported 42.1% of population had high waist circumference and 72% had higher waist hip ratio.

5. Conclusion

Obesity was seen in 47.67% males and 49% females with the criteria of BMI ≥25 kg/m² and there was no gender wise significant different for obesity prevalence. Prevalence of obesity (BMI>25 kg/m²) was found higher in ≥55 years of age group in both males and females. 71.67% females and 46.67% males were found to have central obesity and gender wise waist circumference shows significant difference.There was a positive correlation between BMI and waist circumference. As value of BMI increased value of waist circumference increased and vice versa.

6. References

1. World Health Organization Expert Committee: Physical status, the use and interpretation of anthropometry. Report of a WHO expert Committee Technical report series 854, WHO Geneva, 1995.
2. Bakari AG, Onyemelukwe GC, Sani BG, Aliyu IS, Hassan SS *et al.* Obesity, Overweight and underweight in suburban northern Nigeria. Int J Diabetes and Metabolism 2007; 15: 68 – 69.
3. Centers for Disease Control and Prevention (CDC). Obesity among adults in the United States; No statistically change since 2003 – 2004. Data brief Number 1. November 2007. 8 pp. Available from : http://www,cdc.gov/nchs/data/databrief/db01.pdf
4. Quetelet AD. Physique De 'LHomme, quoted by pengelly CDR. Body mass index and abdominal girth in the diagnosis of obesity. Proc. R Col Physicians, Edinburg 1994; 22: 39 – 47.
5. World Health Organisation Technical report series 894: Obesity: preventing and managing the global epidemic. Geneva: World Health Organisation 2000.
6. National Family Health Survey-3, India, 2005-2006 Adult Nutrition: (cited 2009 May 10) available on

7. www.nfhsindia.org/NFHS.../NFHS-3%20Nutritional%20Status%20of%20Adults.ppt.
8. Saxena *et al.*, Prevalence of risk-factors of non-communicable diseases in rural population : Indian Journal of Community Health, Vol. 23, No. 2, July- Dec. 2011
9. Anuradha R., Ravivarman G., Timsi Jain, the Prevalence of Overweight and Obesity among Women in an Urban Slum of Chennai: Journal of Clinical and Diagnostic Research. 2011 October, Vol-5(5): 957-960
10. Utoo Priscilla Mwuese *et al.* Prevalence of Obesity amongst Staff and Students of a Tertiary Institution in Nigeria: Journal of Dental and Medical Sciences. Volume 10, Issue 4 (Sep.- Oct. 2013), 24-28
11. Mehan *et al.*, Risk factor profile of Non communicable diseases among middle income (18-65 years) free living urban population of India : Int J Dib Ctries, Dec 2006,vol.26:4.