A STUDY ON OBESITY AMONG FACULTIES OF A MEDICAL COLLEGE IN AHMEDABAD

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ABSTRACT

Background: The problem of obesity is on the rise with excessive consumption of processed food and lack of physical exercise. The present study was carried out with objectives to find out the prevalence of obesity and associated factors among the medical professionals.

Methods: A Cross-sectional study was carried out amongst 300 faculties of AMC MET medical college and its affiliated LG Hospital. The statistical analysis was done using SPSS version17.0.

Results: The study population comprised of 113 (37.67%) females and 187 (62.33%) males. Prevalence of obesity and overweight were 15.7% and 48% respectively. Males were statistically significantly more overweight than females (p value=0.028), but there was no statistically significant difference between obesity among males and females (p value=0.817). Amongst the male faculties waist circumference was statistically significantly higher in those who consumed junk food frequently. Stress had a positive association with all the parameters in both sexes except waist circumference in males and diastolic BP in females which were not affected by stress.

Conclusion: The life style factors like stress, exercises and dietary patterns are closely associated with the obesity and its health impacts. The healthy life style practices should be followed to reduce the burden of non-communicable diseases.

Key words: Blood Pressure, Body Mass Index, Diet, Obesity, Physical Activity, Prevalence, Stress, Waist Circumference

INTRODUCTION

Obesity can be seen as the first wave of a defined cluster of non communicable diseases called "New World Syndrome," creating an enormous socioeconomic and public health burden in poorer countries. The World Health Organization has described obesity as one of today's most neglected public health problems, affecting every region of the globe.[1] Obesity, recognized as a disease for more than 60 years, is now of such epidemic proportions that its impact threatens the capacity of health services even in the richest countries. In 2014, more than 1.9 billion adults aged 18 years and older were overweight. Of these over 600 million adults were obese. Overall, about 13% of the world's adult population (11% of men and 15% of women) were obese in 2014. [2] Excess weight gain is ranked the third greatest risk factor after smoking and high blood pressure for all premature deaths and disabilities in the affluent world. [3,4,5] Yet the situation is even worse in poorer countries. [5]

India is following a trend of other developing countries that are steadily becoming more obese. As per 2007 National Family Health Survey, 12.1% males & 16 % females in India fall in category of overweight or obese with Punjab , Kerala , Goa &

Tamil Nadu being the top four rankers in both male & female obesity.[6]

The lifestyle factors are changing in the country attributable to the recent economic growth, the population growth, the change in the societal milieu and increased urbanization .Consequentially, the dietary habits of individuals have changed substantially coupled with dip in physical activity.[7] The increasing prevalence of overweight and obesity is associated with many diet- related chronic diseases.[8].Adult obesity is difficult to treat and more than 50% of obese children become obese adults with worse complications. Studies across the country have reported the prevalence of obesity in the range of 3% to 29%. It is found to be more prevalent among urban and educated population.[7] The great prevalence of this condition, its severe consequences and the difficulty of treating it make the prevention of obesity a major public health priority.

Medical faculties have full knowledge and awareness about the causation, consequences, unhealthy life style factors and prevention of overweight/obesity. Hence the present study was undertaken to explore the prevalence of overweight and obesity amongst them and at the same time to correlate obesity with various factors like diet, physical activity, stress and sedentary life style etc.

MATERIALS AND METHOD

The present cross sectional study was conducted among faculties of AMC MET Medical College and affiliated LG Hospital from April 2013 to September 2013. The respondents were tested with the help of a pretested pre-designed proforma by the faculty of Community Medicine Department and final MBBS undergraduate students of AMCMET Medical College, Ahmedabad.

Verbal informed consent was obtained from each respondent prior to the interview, physical examination and anthropometric measurements. Only the faculties who gave consent were included in the study. Height and weight were measured by standard techniques.[9,10] Body Mass Index (BMI) (defined as weight/height (Kg/M²)) was used for assessing obesity. Those with BMI < 18.5 were classified as underweight, 18.5-24.9 normal range and > 25 overweight. Further BMI of 25-29.9 was classified as pre-obese, 30-34.9 obese I, 35-39.9 obese II and > 40 obese III.[10] Waist circumference was measured at the midline of iliac crest and lower costal margin. Blood pressure was measured by mercury sphygmomanometer.

The collected data were analyzed separately for males and females and tests of significance were applied wherever applicable. The software SPSS 17.0 was used for statistical analysis.

RESULTS

Table 1 presents the socio-demographic profile of the subjects. The study population comprised of 113 (37.67%) females and 187 (62.33%) males with a M:F of 1.65:1. Majority 103 (34.33 %), of subjects fall in age group of 34-43 years. Out of total, 270 (90%) of the respondents were married.

Total 51 (27.27%) of male faculties and 50 (44.25%) of female faculties were having BMI in normal range. Overall prevalence of obesity and overweight were 15.7% and 48% respectively. In females, the prevalence of obesity and overweight was 15% and 39.82% respectively while in males, it was 16% and 52.94% respectively. Only 1 male (0.53%) and 1 female (0.88%) faculty belonged to category of underweight i.e. having BMI < 18.5kg/m² . Males were statistically significantly more overweight than females (p value=0.028; 95 %CI males [44.8%-59.1%] ; 95 %CI females [30%-47%]). But there was no statistically significant difference between obesity among males and females (p value=0.817; 95 %CI males [10.7%-21.2%] ; 95 %CI females [8.4%-21.5%]). (Table 2)

Table 1: Socio-demographic profile of respondents

Socio-demographic variables	Frequency (n=300) (%)
Age (years)	
24-33	81 (27)
34-43	103 (34.33)
44-53	84 (28)
54-63	32 (10.67)
Sex	
Male	187 (62.33)
Female	113 (37.67)
Marital Status	
Married	270 (90)
Unmarried	29 (9.67)
Divorcee	1 (0.33)
Widow	0 (0)

Table 2 : Distribution of study subjects according to BMI

BMI (kg/m²)	Males (n=187)	Females (n=113)	Total (n=300)
<18.50	1 (0.53)	1 (0.88)	2 (0.66)
18.50-24.99	51 (27.27)	50 (44.25)	101 (33.66)
25.00-29.99	99 (52.94)	45 (39.82)	144 (48)
30.00-34.99	24 (12.83)	13 (11.5)	37 (12.33)
35.00-39.99	5 (2.67)	1 (0.89)	6 (2)
>40	1 (0.53)	3 (2.65)	4 (1.33)

Figure in parenthesis indicate percentage

Table 3: Sex-wise distribution of variables amongst study population

Variables	Males (n=187)			Females (n=113)			P
	Present	Absent	95% CI*	Present	Absent	95% CI*	value
Regular Fruit Diet	108 (57.7)	79 (42.3)	(0.50-0.64)	79 (69.9)	34 (30.1)	(0.61-0.78)	0.034
Frequent junk Food Consumption	128 (68.4)	59 (31.6)	(0.61-0.75)	61 (53.9)	52 (46.1)	(0.44-0.63)	0.0111
Stress	124 (66.3)	63 (33.7)	(0.59-0.73)	59 (52.2)	54 (47.8)	(0.42-0.61)	0.015
Regular Exercise	166 (88.7)	21 (11.3)	(0.84-0.93)	101 (89.3)	12 (10.7)	(0.83-0.95)	0.872
Contribution in Routine Household Activity	119 (63.6)	68 (36.4)	(0.567-0.705)	68 (60.1)	45 (39.9)	(0.51-0.69)	0.544
Climbing Stairs	95 (50.8)	92 (49.2)	(0.43-0.57)	54 (30)	59 (70)	(0.21-0.38)	0.0004
Walking Short Distance	97 (51.8)	90 (48.2)	(0.44-0.58)	81 (71.6)	32 (28.4)	(0.63-0.79)	0.0007

Figures in parenthesis indicate percentage
*95% confidence interval of positive parameter

Table 4: Association of parameters with dietary pattern

Parameters	Males (n= 187)		P value	Females (n=113)		P value
	Present	Absent		Present	Absent	
Regular Fruit Diet						
BMI	27.38+4.26	26.76+3.26	0.261	24.82+5.33	26.35+2.82	0.049
Systolic BP	127.65+8.31	127.62+8.65	0.981	125.19+8.44	126.42+8.72	0.490
Diastolic BP	85.94+8.11	87.24+8.05	0.278	84.23+6.13	85.15+7.95	0.549
Waist Circumference	91.53+8.03	91.98+7.08	0.685	85.10+9.38	87.97+8.02	0.102
Junk Food Consumption						
BMI	27.62+4.05	26.03+3.23	0.276	24.76+4.16	25.90+5.39	0.217
Systolic BP	128.23+8.52	126.34+8.14	0.148	126.26+7.98	124.71+9.1	0.342
Diastolic BP	86.97+8.27	85.46+7.65	0.224	84.2+6.92	84.86+6.46	0.601
Waist Circumference	92.8+7.72	89.37+6.90	0.0029	84.61+7.68	87.55+10.34	0.094

Table 5: Association of parameters with stress and physical activity

Variables	Males (n=187)		P value	Females (n=113)		P value
	Present	Absent		Present	Absent	
Stress						
BMI	27.58+3.91	26.20+3.67	0.018	26.44+4.87	23.98+4.35	0.005
Systolic BP	128.5+8.66	125.94+7.74	0.042	127.83+8.8	123.02+7.44	0.002
Diastolic BP	87.50+8.17	84.51+7.61	0.014	85.42+7.84	83.47+5.01	0.115
Waist Circumference	92.46+7.42	90.27+7.87	0.069	88.42+9.13	83.19+8.22	0.001
Exercise						
BMI	27.18+3.93	26.66+3.42	0.524	25.35+4.7	24.5+ 5.04	0.587
Systolic BP	127.2+8.45	131+7.63	0.043	125.52+ 8.36	125.82+10.13	0.922
Diastolic BP	86.13+7.93	89.33+8.97	0.131	84.77+6.56	82+ 7.74	0.255
Waist Circumference	91.51+7.58	93.37+7.94	0.319	85.9+ 9.11	86.36+9.08	0.870
Routine Household Activity						
BMI	26.56+3.64	28.10+4.10	0.011	25.29+5.29	25.26+ 3.88	0.972
Systolic BP	126.71+8.24	129.26+8.56	0.049	124.68+9.03	126.91+7.51	0.157
Diastolic BP	85.38+8.36	88.44+7.24	0.009	84.06+6.90	85.18+6.38	0.378
Waist Circumference	91.14+7.67	92.74+7.49	0.165	83.74+9.33	89.36+7.53	0.0006
Climbing Stairs						
BMI	26.81+3.15	27.44+4.49	0.269	24.74+4.20	25.78+5.23	0.244
Systolic BP	125.54+8.06	129.8+8.3	0.0005	124.30+8.80	126.72+8.71	0.145
Diastolic BP	84.38+6.80	88.67+8.74	0.0003	83.7+6.71	85.24+6.65	0.223
Waist Circumference	90.18+6.45	93.31+8.41	0.0049	84.90+8.16	86.92+9.80	0.234
Walking Short Distance						
BMI	27.10+3.85	27.14+3.91	0.943	25.84+4.97	23.80+3.88	0.023
Systolic BP	126.76+7.98	128.58+8.83	0.142	125.73+8.91	125.10+7.44	0.702
Diastolic BP	85.26+7.36	87.82+8.65	0.031	84.22+7.07	85.23+5.62	0.427
Waist Circumference	90.70+7.15	92.82+8.00	0.058	86.23+9.39	85.21+8.26	0.571

Mean BMI of males was 27.12 + 3.87 kg/m² while in females it was 25.28 + 4.77 kg/m². This difference was highly significant (p value =0.0003). Mean Systolic BP in males was 127.64 +8.43 mm Hg while in females it was 125.55+ 8.50 mm Hg .This difference was significant (p=0.039). Mean Diastolic BP in males was 86.49+ 8.09 mm Hg while in females it was 84.50 + 6.69 mm Hg. This difference was again statistically significant (p=0.0286). Mean Waist Circumference of males

was 91.72 + 7.63cm while in females it was 85.95 + 9.06 cm.

Distribution of variables was compared between male and female faculty. It was observed that consumption of regular fruit diet and practice of walking short distances for routine work was statistically significantly higher in females. Consumption of junk food, stress and practice of climbing stairs was statistically significantly higher amongst males. The practice of regular exercise was high in both the groups and there was no statistically significant difference in that. Contribution to routine household activity was almost equal in both groups with no statistically significant difference. (Table 3)

Association of BMI , Systolic and Diastolic BP and Waist Circumference with dietary pattern was assessed amongst the faculty. The two parameters in diet namely regular fruit diet and frequent consumption of junk food were associated with above mentioned parameters. While associating regular fruit consumption with BMI it was observed that BMI was statistically significantly lower in female faculties who consumed fruits regularly as compared to male faculties. There was no significant difference in other parameters between males and females when associated with regular fruit consumption. As far as association of frequent junk food consumption with all parameters is concerned, it was observed that amongst the male faculties waist circumference was statistically significantly higher in those who consumed junk food frequently. There was no statistically significant difference in other parameters. (Table 4)

Four components of the physical activity namely regular exercise, climbing staircases, walking short distances and contribution in routine household activities as well as stress were associated with various parameters i.e BMI, Systolic BP, Diastolic BP and Waist Circumference. It was observed that stress has a positive association with all the parameters in both sexes except waist circumference in males and diastolic BP in females which were not affected by stress.

The effect of contribution in routine household activity was assessed on the various parameters and it was observed that all the parameters amongst male faculties were on lower side in those contributing in routine household activity with significant statistical difference in case of BMI , Systolic Blood Pressure and Diastolic Blood Pressure. Even in female faculties, Systolic Blood Pressure , Diastolic Blood Pressure and Waist circumference were lower in those contributing in routine household activity but only waist circumference was having statistically highly significant difference in both the groups. Male faculties who are climbing stair-

case in routine day to day functions had statistically significantly lower systolic blood pressure, diastolic blood pressure and waist circumference where as there was no statistically significant difference amongst female faculty as far as these parameters are concerned. Diastolic Blood pressure was statistically significantly lower in male faculties who had practice of walking short distance for their routine work. There was no significant difference in all other parameters. However, BMI was statistically significantly lower in the female faculties who were not walking for short distance for routine activities which may be due to confounding effect of the exercise in other forms.(Table 5)

DISCUSSION

The present study reported a mean weight of 72.96 + 11.94 kg which is higher than the mean weight in the study conducted by Thakkar H K, Misra SK , Gupta SC.[8] This can be due to the fact that latter study was conducted among younger population i.e. population of college students. The findings of the present study in relation to weight are also higher than Indian Reference weight for man & woman as per ICMR standards.[11]

High prevalence of overweight and obesity was found among males (68.98%) as compared to females (54.86%). This was in sharp contrast to other studies where the prevalence of overweight and obesity was more in females .[12]

The prevalence of overweight and obesity among medical faculties of Ahmedabad was higher than the values reported in NFHS 3. [13,14,15]

The difference in the prevalence of these studies from the present study may be attributed to different socio-cultural environment along with diverse regional food habits.

Prevalence of overweight and Grade I & Grade II obesity was found to be higher among women than men and prevalence of Grade III obesity was higher among females which is consistent with other studies.[16]

Mean BMI for males in the present study is 27.12 + 3.87 and for females 25.28 + 4.77 which is very high as compared to mean BMI for males and females in India as per NFHS -3 (20.2 kg/m2 for men & 20.5 kg/m2 in women) & other studies.[15] In the present study , mean systolic BP for males & females was 127.64mmHg + 8.43 and 125.55 mm of Hg + 8.50 respectively which was slightly higher than the age adjusted BP for males & females in the study conducted by by Mohsen Janghorbani et. al.[15]

Similarly mean Diastolic BP for males and females (86.49 mm of Hg + 8.09; 84.50 mm of Hg + 6.69) in our study was higher than the study conducted by Mohsen Janghorbani et. al. [15]

The difference in the waist circumference was also higher among males (91.72 cm + 7.63) than females (85.95 cm + 9.06) which was in sharp contrast to other studies.[15]Results may be explained by differences in the physical activity or calorie intake between the two groups, female faculties being slightly health conscious than males. The age adjusted mean waist circumference in 19 populations studied in WHO MONICA project was 83 to 98 cm in men and 78 to 91 cm in women which was similar to our study [16]

CONCLUSION

Lifestyle of an individual mainly exercises, stress and diet has a direct impact on causation of overweight and obesity. They are pointers to institute measures to tackle the growing menace of obesity and its health consequences on a public health basis. Urgent measures are required for their control.

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