

## Original Research Article

# Is obesity among medical students a matter of concern? a cross-sectional study in MKCG medical college, Berhampur, Odisha, India

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### ABSTRACT

**Background:** Overweight and obesity are the precursor of most of the non communicable diseases. Body mass index is an important indicator to measure obesity. Though medicos have the requisite knowledge on the morbidities associated with overweight and obesity, they are not in an advantageous position as compared with the common man due their life style.

**Methods:** A cross sectional study was conducted among 372 undergraduate students attending the classes at Department of Community Medicine, MKCG Medical college, Berhampur, Odisha. BMI of the students was measured, and socio-demographic characteristics and other risk factors were assessed during the study with the help of a semi structured, pretested questionnaire.

**Results:** Out of 372 students, 67.7% were males. Mean BMI of the students was 23.68 ranging from 14.96 to 43.70. The overall prevalence of obesity and overweight was 4.8% and 24.2% respectively. Overweight and obesity were significantly ( $p < 0.05$ ) associated with age, family history of obesity, place of residence, frequent fast food consumption. However other variables like use of electronic gadgets and vehicles, place of food consumption didn't show any significant association.

**Conclusions:** Medical students being the future physicians, greater emphasis should be laid among them in terms of prevention of obesity and overweight and on reinforcing all preventive measures like physical activities, correct diet, and maintenance of correct BMI. This will in the long run help in enhancement of control of many non-communicable diseases which are associated with overweight and obesity.

**Keywords:** Body mass index, NCD, Overweight, Obesity

### INTRODUCTION

Obesity and overweight is emerging as one of the most serious public health with a remarkable increased prevalence worldwide over the past 3 decades among children, adolescents and adults in the 21<sup>st</sup> century. Obesity is the most prevalent form of malnutrition and is a multifactorial condition, being affected by genetic and non-genetic factors and their interactions.<sup>1</sup> Obesity is defined as an abnormal growth of adipose tissue. Overweight is usually due to obesity but can arise from

causes like fluid retention or abnormal muscle development and is most often defined by the body mass index (BMI).<sup>1</sup> BMI has been one of the commonest way to determine the transition of a person from normal weight to obesity which is simple to calculate and to categorize a person.<sup>1</sup>

As per WHO data in 2016, adults of age 18 years and older, were overweight 1.9 billion and of these 650 million were obese.<sup>2</sup> Around 39% of adults aged 18 years were overweight and 13% were obese. Most of the

world's population live in countries where overweight and obesity kills more people than underweight. As per 2016 data over 340 million children and adolescents aged 5-19 years were overweight or obese.<sup>2</sup>

According to NFHS-4 (2015-16), around 21% of Indian women and 19% of Indian men are overweight or obese. Significant difference in prevalence of overweight and obesity exists between rural and urban areas. In Odisha around 17% women were obese or overweight similarly around 17% of men are overweight or obese.<sup>3</sup> Some ethnic groups (e.g. Hispanic and South Asian) appear to have a tendency for overweight.<sup>4,5</sup>

Obesity being a proinflammatory state, the risk of several chronic diseases like hypertension, dyslipidemia, diabetes, cardiovascular disease, asthma, sleep apnea, osteoarthritis and several cancers is increased in adults.<sup>6</sup> Throughout the medical education career, a student passes through terminable pressure and psychological stress but unfortunately such things cannot be modified at college level.

The amount of material to be absorbed, social isolation, pressure of examination, discrepancies between expectation and reality throughout the course of training largely contributes to this. Hence makes us to anticipate that they would be more prone to obesity due to their lifestyle with less physical activity and disordered eating habits and thereby are prone to obesity related health hazards.<sup>7</sup>

Though several studies were being done on obesity among medical students but very limited in this part of India especially Odisha. With this backdrop this study was being planned in MKCG medical college, Berhampur, Odisha with an objective to determine the prevalence and various correlates of overweight and/or obesity among medical undergraduate students.

## METHODS

It is an institutional based cross-sectional study. The study conducted at Maharaja Krushna Chandra Gajapati Medical College, Berhampur, Odisha between September 2016 to February 2017. Total 372 students who gave consent were enrolled in this study. Sampling method was convenient sampling in the present study. The study population was under graduate MBBS students attending the classes of Community Medicine from 1<sup>st</sup> semester to 7<sup>th</sup> semester

### Inclusion criteria

Under graduate students willing to participate and gave informed consent were included in the study.

### Exclusion criteria

Those who did not give consent were excluded.

### Study tools

- Predesigned, semi structured, pretested questionnaire.
- Portable weighing machine (properly calibrated)
- Stadiometer.

### Method of data collection

A self-administered predesigned, pretested, semi-structured questionnaire containing a set of questions regarding obesity was distributed to all participants after explaining the details about the study. Data was collected regarding place of residence, physical activity status, dietary pattern and frequency, family history of obesity, use of vehicle. Weight and height were measured by standard operating procedure. Measurement of weight was done by properly calibrated weighing machine. During weighing of shoes were removed and clothing kept minimal. Average of three readings was recorded. Stadiometer was used to measure the height. Average of three readings was recorded. BMI was calculated according to:  $BMI = \text{weight(kg)} / \text{height}^2(\text{m}^2)$ . In present study we used WHO criteria for BMI and categorized overweight (BMI of 25 to 29.99), whereas obesity is classified into 3 grades-Grade-1(BMI 30.0-34.9), Grade-2(BMI 35.0-39.9) and Grade-3(BMI  $\geq 40$ ).<sup>2</sup>

### Statistical analysis

Statistical software like SPSS 17.0 and Microsoft Excel were used for the data analysis. Clearance from the Institutional ethical committee was obtained prior to the beginning of the study. Informed consent was obtained from all the study participants

## RESULTS

Among total 372 participants majority (72.6%) were males. Mean (SD) age of the study population was  $23.22 \pm 1.79$  years. Most of the students (79%) resided in hostel. Family history of obesity was found among 22.6 % of the respondents. Height of the study population varied from 125cm to 210cm with mean (SD) height of  $168 (\pm 10.49)$  cm and weight from 46Kg to 105Kg with mean (SD) weight  $66.67 (\pm 10.76)$  Kg. BMI of the students were in the range from 14.96 to 43.70 with mean (SD) BMI  $23.68 (\pm 4.27)$  (Table 1).

In present study prevalence of overweight and obesity was found to be 24.2% and 4.8% respectively but 4.8 % students were found to be underweight. Incidentally all the underweight students were females (Table 2). Overweight and obesity was found to be higher among males as compared to females (Figure 1).

Age [(OR =1.65, (1.04-2.55)], family history of obesity [(OR =2.25, (1.34-3.73)], residence [(OR= 1.73, (1.02-2.92)] and consumption of fast food [(OR =2.76, (1.79-4.38)] were found to be significantly associated with

overweight/obesity in binary logistic regression. Strength of association of variables such as age [AOR = 2.25 (1.34- 3.76)], family history of obesity [AOR = 3.31 (1.71- 6.11)] and fast food consumption [AOR = 2.24

(1.35- 2.71)], stayed significant and gender [AOR = 3.27 (1.5-7.1)] was found to be significantly associated when adjusted with other variables in the multivariate analysis (Table 3).

**Table 1: Background information of study population (n=372).**

Variables	Frequency (%)	
Gender	Male	270 (72.6%)
	Female	102 (27.4%)
Age	Age of the study population varied from 20years to 26years with mean (SD) age = 23.22±1.79years	
Residence	Hostel	294 (79%)
	At home	78 (21%)
Family history of obesity	Yes	84 (22.6%)
	No	288 (77.4%)
Height	Height of the study population varies from 125cm to 210cm with mean (SD) height = 168±10.49cm	
Weight	Weight of the study population varies from 46 Kg to 105 Kg with mean (SD) Weight = 66.67±10.76Kg	
BMI	BMI of the study population varies from 14.96 to 43.70 with mean (SD) BMI = 23.68±4.27	

**Table 2: Distribution of study population according to BMI (n=372).**

BMI	Number	Percentage (%)
Underweight	18	4.8%
Normal	246	66.2%
Overweight	90	24.2%
Obese	18	4.8%

**Table 3: Bivariate and Multivariate logistic regression for association of overweight and obesity with different covariates.**

Co-Variates	Overweight/ Obesity n (%)	OR (CI)	AOR (CI)	
Age (years)	>23.22	60 (34.5)	1.65(1.04-2.55)**	2.25(1.34-3.76)**
	≤23.22	48 (24.2)	Ref	Ref
Gender	Male	86 (31.8)	1.5(0.92-2.44)	3.27(1.5-7.10)**
	Female	21 (20.5)	Ref	Ref
Family history of obesity	Present	36 (42.9)	2.25(1.34-3.73)**	3.31(1.79-6.11)**
	Absent	72 (25)	Ref	Ref
Residence	Home	30 (38.5)	1.73(1.02-2.92)**	1.13(0.52-2.42)
	Hostel	78 (26.5)	Ref	Ref
Fast Food	Consuming	64 (41.3)	2.76(1.79-4.38)**	2.24(1.35-2.71)**
	Not Consuming	44 (20.3)	Ref	Ref

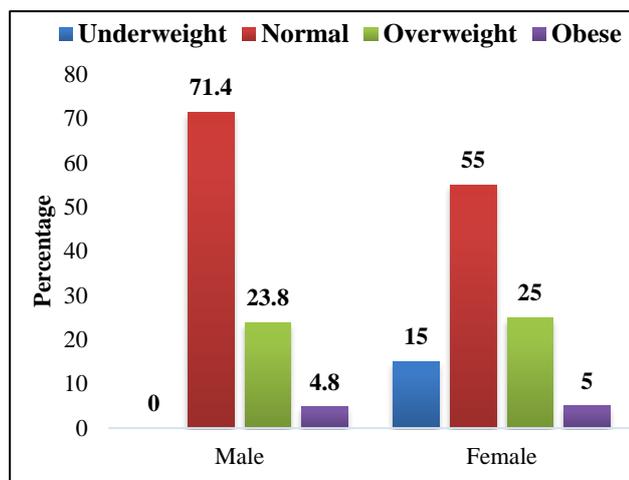
\*\*Statistically significant (p <0.05)

## DISCUSSION

In present study prevalence of overweight and obesity was found to be 24.2% and 4.8% respectively which is higher than that observed by the study done by Chhabra

et al, (11.7% and 2%).<sup>8</sup> Among medical students of Delhi and by Aggarwal et al, where the prevalence of obesity was 6.5%, pre-obese as 10% and overweight as 32% respectively.<sup>9</sup> In the study conducted by Selvaraj K et al, prevalence of overweight was 24.3% and obesity was

8.6% and Jayaraj et al, where the prevalence of overweight was 31.3% and obesity as 6.3% respectively which was higher than our study.<sup>10,11</sup>



**Figure 1: Distribution of study population according to BMI and gender.**

Majority (79%) resided in hostel in present study which was similar to the studies done by Fernandez et al, (82.4%) and Anupama M et al, (69%).<sup>7,12</sup> The mean height and weight of the study population was of  $168 \pm 10.49$  cm and  $66.67 \pm 10.76$  Kg respectively which was all most similar to study by Anupama M et al, (ht =  $164 \pm 8.737$  and wt. =  $61.23 \pm 10.064$ ).<sup>12</sup> The BMI in present study varied from 14.96 to 43.70 with mean  $23.68 \pm 4.27$  kg/m<sup>2</sup>. In the study by Tiwari R et al, the mean BMI for males was  $21.51 \pm 3.03$  and  $21.32 \pm 3.30$  for females.<sup>13</sup>

Incidentally 4.8% of them were underweight which is very less as compared to Tiwari R et al, (19.08%) but almost similar to the study by Jayaraj et al, (4.5%).<sup>11,13</sup>

Prevalence of overweight and obesity in male students was 23.8% and 4.8% and in female students was 25% and 5% respectively. In present study the prevalence of overweight/obesity in both females and males is slightly above the national data and also higher than the study by Fernandez et al, in Pune (16.6% among females and 10.7% among males).<sup>3,7</sup> Similarly, lower prevalence was also reported by Gupta et al, in Kolkata, Deatale et al, in Mumbai and Anitha et al, in Thiruporur.<sup>6,14,15</sup> These differences in the prevalence may be due to the geographic location and time frame of study.

In present study 22.6% of the respondents had family history of obesity and it had significant association with obesity. In the study by Veena et al, family history of obesity was also found to be one of the important factors associated with obesity.<sup>16</sup> Consumption of fast food was found to be another important factor associated with obesity in current study which is consistent with findings of Shah Tet al, and Deotale et al, in their studies.<sup>6,17</sup> This

is already proven by the fact that if one parent is obese there are 50% chances of children being obese and when both parents are obese the children have an 80% chances of being obese.<sup>8</sup>

Physical inactivity did not show a significant association with the development of overweight/obesity which also seen in study by Boo et al.<sup>18</sup> This is contradictory to the studies done by Zeeshan et al, and Fernandez et al, where physical activity showed significant association with obesity.<sup>7,19</sup>

Baker et al, reported that the most important life style factors responsible for obesity were, long time spent using computer, eating more during time of stress and snacking between meals.<sup>20</sup> But in the present study, overweight/obesity was not associated significantly with watching TV/using computer or internet.

## CONCLUSION

The present study concludes that obesity and overweight are quite prevalent among the medical students. Since prevention is always better than treatment the modifiable factors such as increased fast food consumption, increased soft drinks, watching television and playing computer games and lack of outdoor games are more important from prevention point of view. In this regard the concerned college can play a significant role in encouraging healthy behavior in students.

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