

Study the association of body mass index and obesity in MBBS students with their family health status in a Tertiary Care Hospital, Puducherry



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ABSTRACT

Background: Overweight-obesity has turned into a worldwide epidemic due to sedentary lifestyle with more eating and less physical activity. The overweight and obesity rising among young people give alarm which may cause the formation link to the rise of other non-communicable diseases such as hypertension, diabetes, myocardial infarction, and stroke are the most important concern. Medical students are exposing lot of stress in their education and this stressful condition leads to irregularity in diet, lack of exercise, and their family health history, each being considered an independent factor leading to obesity. **Aims and Objectives:** The aim of the study was to estimate the prevalence of overweight and obesity among 2nd year MBBS students and find the association between family history with body mass index (BMI). **Materials and Methods:** This study included 150 MBBS students' BMI survey from SVMCHRC, Puducherry. The height and weight of the students were measured and BMI was calculated using formula. Students parents health status data were collected and the association of BMI and family history was established. **Results:** Based on student BMI details, the study found that overweight was 18% and obese was 38%. Student parents health details obtained and studied possible future risk for obese student. **Conclusion:** Students are overweight-obese that particular students family history was collected. They are susceptible to the future development of cardiovascular disease, Type II diabetes, hypertension, osteoarthritis, anesthesia risks, and menstrual abnormalities as well as some types of cancers including those of colon and breast. So that students necessary health promotional activities are suggested to adopt healthy life style including regular physical exercises, yoga, and good dietary habits that are advised for healthy life style.

Key words: Body mass index; Medical students; Normal weight; Obesity; Overweight; Under weight

INTRODUCTION

Life-threatening disorders such as metabolic, cardiovascular, and other non-communicable diseases associated with obesity.¹ Overweight and obesity are defined as "abnormal or excessive fat accumulation that causes risks to health" by the World

Health Organization (WHO).² In 2014, adult 18 years and older overweight percentage were more than 1.9 billion (39%). Of these over 600 million (13%) were obese. Overall, the world's adult population obese percentage was about 13% in 2014.³ Younger age groups people about one-fifth of Indian children and adolescents are either overweight or obese.⁴

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Obesity is a major risk factor for Type II diabetes mellitus, hypertension, gall stones, non-alcoholic fatty liver disease, and osteoarthritis.⁵ Childhood obesity increases the risk of Type 2 diabetes and hypertension in the future by 5.4 and 2.7 times, respectively.⁶

Medical profession has long duty hours, different food timings, and exposure to stressful situations which put the medical students at risk of developing lifestyle associated disorders including overweight and obesity.⁷ The study result from the central and South India shows that 9.4%–38% prevalence of overweight-obesity among MBBS students.^{8,9} However, dietary habits and physical activity patterns differ across the country. Medical student lifestyle pattern and stressfulness of studies have been changed under COVID-19 situation. The parent genetic factor is may play a role for student lifestyle disorder development. Hence, taking this consideration, we have conducted this study in our tertiary care hospital in Puducherry.

Aim and objectives

The aim of the study was to assess the prevalence of overweight-obesity among MBBS students from a medical college in Puducherry and find the association with family health history.

MATERIALS AND METHODS

This study was conducted in Sri Venkateshwara Medical College Hospital and Research Centre, Puducherry, between May 2021 and July 2021. The study protocol obtained approval from the Institutional Review and Ethics Committees and all subjects provided informed written consent. The study subjects included MBBS students from second professional years. All 150 MBBS students were eligible for the study. The exclusion criteria were (i) pregnancy, (ii) students on glucocorticoids, antidepressants, and antipsychotics, and (iii) students suffering from chronic kidney disease, chronic heart failure, chronic liver disease, and tuberculosis. A self-administered questionnaire was used to collect the sociodemographic details, family history of diabetes, family history of hypertension, and relevant past medical history.

A cross-sectional study among 150 students; data will be collected after taking a informed consent. We measured height, weight, blood pressure, blood sugar, and hemoglobin in all the students. Electronic weighing machine used to measure weight in kilograms (kg). Stadiometer was used to measure the height in centimeters (cm) and was recorded to the nearest 1 cm.

The recommended standard formula was used to calculate the body mass index (BMI), in which “weight in kilograms is divided by square of height in meters (kg/m^2).” The classification of student according to BMI, the WHO Asia specific guidelines were used (i) underweight ($<18.5 \text{ kg}/\text{m}^2$), (ii) normal weight ($18.5\text{--}22.9 \text{ kg}/\text{m}^2$), (iii) overweight ($23\text{--}24.9 \text{ kg}/\text{m}^2$), (iv) obese Grade 1 ($25\text{--}29.9 \text{ kg}/\text{m}^2$), and (v) obese Grade 2 ($>30 \text{ kg}/\text{m}^2$).¹⁰

Statistical methods

The data were analyzed using SPSS software version 23. Values are expressed mean standard deviation. The categorical data were compared between two groups using Chi-square test. The $P < 0.05$ was considered statistically significant.

RESULTS

In this study, total 150 MBBS – second professional student were participated and 79 were male and 71 female students. The mean age of the students was 19.54 ± 0.90 years (Table 1). The mean \pm SD height of the students was 166.52 ± 8.91 cm, the mean \pm SD weight was 65.79 ± 15.66 kg, and the mean \pm SD BMI was $23.83 \pm 4.7 \text{ kg}/\text{m}^2$. Students basic parameters such as BP, pulse rate, glucose, urea, and creatinine mean values were within normal range. The hemoglobin mean value was 13.37 ± 1.70 (Table 1). The student’s distribution percentage age-wise data are given in Figure 1.

Prevalence of overweight-obesity among student group based on BMI

Study subjects were categorized into five BMI categories using the WHO Asia specific cutoffs (Table 2). Among 150 subjects, 27 (18%) were found to be overweight and 48 (39%) were obese 37 (25%) were found to have obesity Grade 1, and 21 (14%) were had obesity Grade 2. Rest of 47 (31%) belonged to normal BMI category and only 18 (12%) had underweight category (Table 2 and Figure 2).

Table 1: Basic anthropometric information about study participants

Parameters	Result
Age	19.54 \pm 0.90
Gender (Male: Female)	79:71
Height (cm)	166.52 \pm 8.91
Weight (kg)	65.79 \pm 15.66
BMI (kg/m^2)	23.83 \pm 4.7
Systolic blood pressure (mm Hg)	112.0 \pm 10.70
Diastolic blood pressure (mm Hg)	75.7 \pm 8.05
Pulse rate (beats per minute)	77.8 \pm 1.20
Glucose	75.81 \pm 11.10
Urea	17.67 \pm 2.21
Creatinine	0.92 \pm 0.18
Hemoglobin	13.37 \pm 1.70

Overweight and obesity were observed more in the male than the female students. Proportion of males was higher in overweight-obese group compared to normal weight group. (Table 3).

Prevalence of disease status for parents

A total of 28 mothers and 23 fathers of the students were reported to be obese. History of hypertension and diabetes was present in 37 and 42 mothers, respectively, while among the fathers of the students, hypertension and diabetes were observed in 44 and 48 of them, respectively. A small number of them showed both the diseases (Table 4).

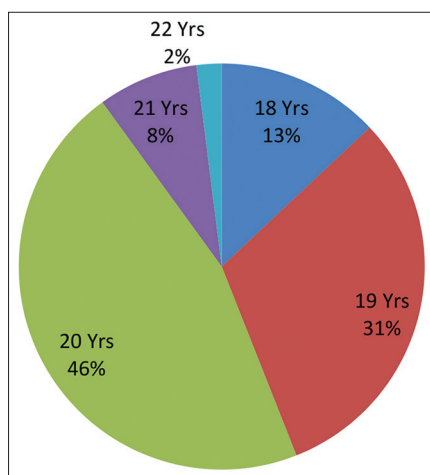


Figure 1: Student distribution – Age-wise

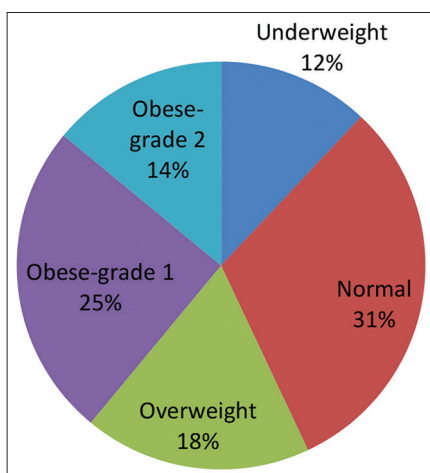


Figure 2: Prevalence of overweight and obesity according to BMI

BMI	Number of Student	Percentage
Underweight (<18.5 kg/m ²)	18	12
Normal (18.5–22.9 kg/m ²)	47	31
Overweight (23.0–24.9 kg/m ²)	27	18
Obese Grade 1 (25.0–29.9 kg/m ²)	37	25
Obese Grade 2 (>29.9 kg/m ²)	21	14

In Table 5, data for BMI based student’s classification and their parents disease status. There obese and overweight students parents had more disease status percentage then to normal and underweight students.

DISCUSSION

In India, the prevalence of overweight-obesity has been doubled in past one decade based on study report of the national family health surveys.¹¹ In our society, overweight-obesity is spreading slowly in all ages and sections. The medical professional doing hard work and absolute dedication but their ignoring their own health due to workload. They remain at risk for development of lifestyle-related disorders that include overweight-obesity.

In our study, number of males – 79 and number of females – 71, all come into the age group of 18–22. Among under weight of medical students 12%, healthy students are 31%, overweight 18%, and obese students 39%.

The aim of present study was to assess prevalence of overweight-obesity among second MBBS students at our Medical College in Puducherry. We had found overweight-obesity in 85 (57%) of 150 students. Our study observation was significant and more than half of the study population comprising of budding doctors was come under the overweight or obese category. Earlier studies from Southern central and parts of India have shown prevalence of overweight-obese among medical students ranging from 9.4% to 37.5%.^{7,8,12,13} The possible reasons for prevalence of overweight-obesity higher in study population of the present study may be (i) dietary habits, (ii) physical activity, and (iii) sociodemographic profile.

In our study, healthy and underweight students were engaged in physical activities such as playing, walking,

Gender	Obese	Over weight	Normal	Under weight	Total %
Male	28 (18.6%)	17 (11.3%)	25 (16.6%)	9 (6%)	79 (53%)
Female	20 (13.3%)	10 (6.6%)	22 (14.6%)	9 (6%)	71 (47%)
Total	48	27	47	18	150

Family disease status	Mother	Father
Obesity	28	23
Diabetes	37	44
Hypertension	42	48

Table 5: Disease status among different BMI status of students

Family disease status	Family member	Obese	Overweight	Normal	Underweight	Total number
Obesity	Mother	12	5	10	1	28
	Father	10	4	8	1	23
Diabetes Mellitus	Mother	16	5	13	3	37
	Father	18	8	14	3	44
Hypertension	Mother	19	8	11	4	42
	Father	24	6	15	3	48

jogging, physical exercises, and yoga. All of the students among overweight and obesity category were not having any physical activity. This study report shows that males have higher percentage (53%) of obese and overweight compare to female (47%). This finding was consistent with the previous studies that males were more predisposed to develop obesity compared to females.

Family history of obesity in either of the parent was present in many students (mothers 28 and fathers 23); similarly, many of them showed a family history of diabetes or hypertension or both. In this present study, obese and overweight students have higher percentage of history of life style diseases pattern such as obese, diabetes, and hypertension of their parents then compare to normal and underweight student BMI.

Hence, these result indicate higher BMI student at the risk of complications of obesity and overweight such as diabetes mellitus, hypertension, osteoarthritis, and coronary artery disorders in the future if they will not change their lifestyle.

Limitations of the study

This small hospital-based study for second MBBS professional may not be representative of community BMI and obesity and similar large number of sample required for community settings to find the BMI and obesity.

CONCLUSION

The prevalence was found to be high among medical college students which were contributed by various factors. This can be reduced by modifying their diet, engaging in regular physical activity. Students were overweight-obese that particular student's family history was collected. They are susceptible to the future development of cardiovascular disease, Type II diabetes, hypertension, osteoarthritis, anesthesia risks, and menstrual abnormalities as well as some types of cancers including those of colon and breast. So that students necessary health promotional activities are suggested to adopt healthy life style including regular

physical exercises, yoga, and good dietary habits that are advised for healthy life style.

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