

Prevalence of obesity and awareness of its risk factors among medical students of a rural teaching hospital of south India: a cross-sectional study

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Abstract

Background: Obesity the most prevalent form of malnutrition in both developed and developing countries and affecting children as well as adults is replacing the more traditional public health concerns. Obesity and overweight are the fifth leading cause of deaths worldwide. As obesity is the key risk factor in natural history of other chronic noncommunicable diseases, obesity prevention strategies offer a cost-effective approach in preventing other chronic noncommunicable diseases. Awareness level is the basic necessity to effect a change in behavior, more so in case of medical students as they can be the health educators of the community.

Objective: To measure the prevalence of obesity; to study the level of awareness with respect to the risk factors of obesity and health problems associated with it; and to study the awareness with respect to the assessment of obesity using body mass index (BMI).

Materials and Methods: A cross-sectional study was carried out at Adichunchanagiri Institute of Medical Sciences, Mandya, Karnataka, India, using pretested structured pilot tested questionnaire and physical examination for anthropometry to measure BMI was done. The data were analyzed using *t*-test, χ^2 -test, and Kruskal–Wallis test.

Result: Among 172 students, 95 were men and 77 were women. It was found that 29.4% men and 16.7% women were overweight and obese, respectively. An overall prevalence of overweight was calculated to be 17.4% and that of obesity was 6.4%.

Conclusion: The prevalence of overweight and obesity was higher compared to other studies and the awareness level was satisfactory.

KEY WORDS: Overweight, obesity, body mass index, awareness, risk factors

Introduction

Obesity is an epidemic of the twenty-first century and is a major causative factor for many other metabolic disorders.

Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health and are the fifth leading cause for deaths globally. About 2.8 million adults die each year as a result of being overweight or obese.^[1]

According to a World Health Organization report, obesity has been identified as a major cause of disability and premature deaths in less developed countries. This has been attributed to shifts in diet and changes in lifestyle.^[1,2] The risk of many diseases including cardiovascular diseases (CVDs), hypertension, hyperlipidemia, diabetes mellitus, and certain cancers increases many folds in association with obesity.^[1–4] It has been estimated that obesity accounts for 2%–7% of total health-care costs. There are also other costs to consider

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such as reduced quality of life and productivity loss attributed to medical leave.^[1]

Demographic, economic, social, and nutritional transitions that occurred in the past decades shifted public health paradigms worldwide in the form of growing prevalence of overweight and obesity in virtually all age groups.^[5] Once considered a high-income-country problem, overweight and obesity are now on the rise in low- and middle-income countries, particularly in urban settings. More than 30 million overweight children are living in developing countries and 10 million in developed countries.^[1-3]

“WHO Action Plan for the Global Strategy for the Prevention and Control of Non-communicable Diseases” provides a roadmap to establish and strengthen initiatives for the surveillance, prevention, and management of noncommunicable diseases, including obesity in low- and middle-income countries and its serious implications for poverty reduction and economic development.^[6]

Medical students are the health-care providers for the community. Adequate sensitization of medical students early in their courses will help them to make healthy choices for themselves, which will also empower them to act as facilitators in influencing community to adopt healthy lifestyles. It is known that appropriate and adequate information can help to increase the knowledge and to reinforce desired behavioral patterns. Hence, assessment of awareness level is an essential prerequisite to plan for any health educational intervention. Also, when people become aware of their existing health condition, for example, in this case their body mass index (BMI), it can be expected that it can act as a catalyst for their behavioral change in the right direction. Thus, an attempt was made to assess the prevalence of obesity among our medical students and their knowledge pertaining to obesity (namely, risk factors, diagnosis, complications associated, and preventive measures).

Materials and Methods

This cross-sectional study was conducted at Adichunchanagiri Institute of Medical Sciences, Mandya, Karnataka, India. All the medical students who were willing to cooperate for the study were included in the study. They were all hostel residents of the medical college. Informed consent to participate in this study was taken and the study was approved by the ethics committee.

The data were collected using a pretested structured questionnaire, and height and weight were measured to determine BMI. BMI was calculated using the formula, weight (kg)/height² (m²). BMI less than 18.9 kg/m² was considered underweight, less than 25 kg/m² was considered normal, 25–29.9 kg/m² was considered overweight, and 30 kg/m² or above was considered obese. The questionnaire was developed after literature review to suit the study population and was pretested and validated by pilot survey of 50 people. It comprised questions on general information of the study subjects, questions to assess the awareness of risk factors for

Table 1: Distribution of study subjects based on their body mass index gender wise

	Gender		Total (172)
	Female (77)	Male (95)	
Normal	44	51	95 (55.2%)
Overweight	10	20	30 (17.4%)
Obese	3	8	11 (6.4%)
Underweight	20	16	36 (20.9%)
Total	77	95	172

χ^2 Statistic = 4.7344; $p = 0.192309$.

Table 2: Analysis of association between gender and body mass index of study subjects

Correlate	Frequency	Mean BMI	df	t-value	p-value	Status
Male	95	22	170	1.516	0.131	NS
Female	77	21				

df, degree of freedom; NS, not significant.

obesity, questions on complications associated with obesity, and questions regarding whether the study subjects were aware of various methods of estimation of obesity.

Data were collected by a three-member survey team, who were trained and standardized especially for height and weight measurement to ensure internal validity. The data forms were scrutinized for missing values and analyzed using OpenEpi.

Statistical Analysis

The data were analyzed using χ^2 -test, t -test, and Kruskal–Wallis test.

Results

Discussion

In our study population of 172 students, 95 were men and 77 were women. Of 95 male students, 20 (21%) were overweight and 8 were obese (29.1%), whereas of 77 female students, 10 were found to be overweight (12.9%) and 3 were obese (16.7%). An overall prevalence of overweight was calculated to be 17.4% and that of obesity to be 6.4%. The observed prevalence of overweight and obesity is on the higher side among our medical students, which may be because of their affluence and also because all the study subjects were hostel inmates staying away from their families and had a habit of eating out regularly.

Chhabra et al.^[7] reported a prevalence of 11.7% overweight and 2% obesity among medical students of Delhi. Our findings are in accordance with their study. In the study conducted by Fernandez et al.,^[8] the proportion of overweight/obesity was 13.2%. In female students, it was 16.6% and in male students was 10.75%.^[8] In a study conducted in Saudi Arabia by Ibrahim et al.,^[9] the prevalence of overweight or obesity was 31.2% among their medical students.

Table 3: Responses of the study subjects that were appropriate with respect to the awareness on risk factors associated with obesity

Questions	Males (95)	Females (77)	Total (172)
Obesity risk increases with age	26	38	64 (37.2%)
Women have higher rate of obesity than men	43	46	89 (51.7%)
Physical inactivity leads to obesity	70	69	139 (80.8%)
Physical activity of 30 min/day on at least 5 days a week is recommended	12	10	22 (12.7%)
Eating in between meals, preference for sweets, refined food, fats increases the risk	68	54	122 (70.9%)
If our parents are obese our tendency to become obese increases	38	30	68 (39.5%)
Drugs such as steroids, OCP, insulin, β -blockers can promote weight gain	24	29	53 (30.8%)

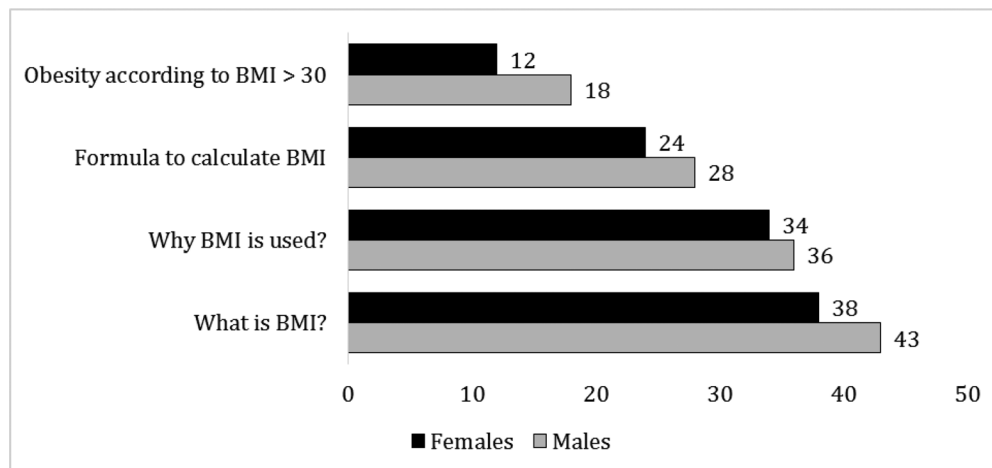
OCP, oral contraceptive pill.

$\chi^2 = 5.515$; degrees of freedom = 6; $p \leq 0.4796$.

Table 4: Responses of the study subjects that were appropriate with respect to awareness on health problems associated with obesity

Questions	Males (95)	Females (77)	Total (172)
Type 2 diabetes mellitus and insulin resistance	52	47	99 (57.5%)
Gallbladder disease	24	19	43 (25%)
Dyslipidemia	26	21	47 (27.3%)
Breathlessness and sleep apnea	29	23	52 (30.2%)
Coronary artery disease and hypertension	34	33	67 (38.9%)
Breast and colon cancer	31	32	63 (36.6%)
Reproductive hormone abnormalities and impaired fertility	44	32	76 (44.1%)
Osteoarthritis, gout, and low back pain	35	36	71 (41.2%)

$\chi^2 = 2.029$; degrees of freedom = 7; $p \leq 0.9582$

**Figure 1:** Appropriate responses of the study subjects with respect to body mass index.

In our study, majority of the study subjects (80%) attributed physical inactivity to obesity followed by dietary causes (71%). In a study conducted by Yerpude and Jogdand,^[10] an overwhelming majority (85.80%) of the subjects attributed diet for obesity.

In this study, about 36.6% study subjects correctly identified breast and colon cancer as the cancers associated with obesity. In a study conducted by Shrivastava et al.^[11] in Kancheepuram district, Tamil Nadu, 50% study subjects correctly identified the cancers associated with obesity.

In our study, only 57.5% study subjects identified type 2 diabetes mellitus to be associated with obesity and 38.9% identified CVDs, though type 2 diabetes mellitus is a major public health problem in India. Only 40% study subjects knew what was BMI and 47% were aware that obesity could be diagnosed using BMI. In a similar study conducted by Shrivastava et al.^[11] in Kancheepuram district, Tamil Nadu, 49% were aware of BMI and that it was associated with obesity diagnosis.

In this study, the most common reason cited by the study subjects for prevention of obesity was adequate physical

activity (80%) followed by dietary modifications (71%). In a study conducted by Shrivastava et al.^[11], the findings were 77.5% and 53.6%, respectively. Similar results were obtained in a systematic review.^[12]

Conclusion

This study found that the prevalence of overweight and obesity was higher than that found in other studies, and the awareness level among the students was found to be satisfactory.

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