ORIGINAL ARTICLE ASIAN JOURNAL OF MEDICAL SCIENCES

A cross-sectional assessment of obesity among medical students of central India

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Submission: 07-03-2024 Revision: 29-03-2024 Publication: 01-05-2024

ABSTRACT

Background: Obesity is one of the leading public health problems, emerging and evolving across the ages from childhood, adolescence, young adults, and middle age to the geriatric sphere of life. The young adult age group also includes the special population of medical students with possible unique stressors and risk factors requiring special attention. **Aims and Objectives:** The current study was planned with the objectives of studying obesity among medical students with a focus on determining the prevalence of obesity problem and associated socioeconomic level and lifestyle variables; dietary calorie intake and physical activity. **Materials and Methods:** The current study is a cross-sectional survey conducted using a pre-tested, semi-structured questionnaire among MBBS students of central India. A total of 400 students were interviewed. Body mass index (BMI) was used to identify and the World Health Organization classification (WHO) was used to categorize the students in nutritional levels. Physical activity level was assessed using the General Practice Physical Activity Questionnaire. Socioeconomic status (SES) was assessed using the Modified Prasad Classification and All India Consumer Price Index. Dietary calorie intake was assessed using 24-h oral questionnaire method. **Results:** The current study finds a prevalence of 7.5% obesity among medical students with another 10% in the pre-obese category as per the WHO classification. It was also found that Male gender, inactivity, and upper SES were significantly associated with the obesity prevailing in this special population of medical students. **Conclusion:** The current study concludes that obesity/pre-obesity is an important problem prevalent among medical students with association with sedentary lifestyle and high SES; thus, recommends screening students for lifestyle disease, dietary modification, change in sedentary lifestyle, and recreational activities to reduce stress.

Key words: Obesity; Medical students; Physical activity; Socioeconomic status

Access this article online

Website: http://nepjol.info/index.php/AJMS

DOI: 10.3126/ajms.v15i5.63561

E-ISSN: 2091-0576

P-ISSN: 2467-9100

INTRODUCTION

Obesity is an emerging problem throughout the world. It not only affects adults, but the younger populace comprising children, teenagers, and young adults are also getting more and more coming into the grip of this problem.[1,2] Many factors may contribute to this problem. Stress is particularly important; as the condition causing it will result in major lifestyle ailments not limited to unbalanced diet, sedentary behaviors, and addictions. These lifestyle behaviors may be measured as autonomous factors leading to obesity.[3,4] The life of a medical student involves long, stressful years of education. Dietary habits like more fast-food and soft drinks consumption with activities promoting a sedentary lifestyle such as prolonged time watching movies, playing video games, and indulging in intake of alcohol and other addictive drugs of abuse; working as a function of stress in this scenario. The stress-based lifestyle ailments may also be addressed in light of socioeconomic status (SES) and physical inactivity.[3-5] The present study was planned with the objectives of finding the prevalence of obesity problems

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in medical students and associated socioeconomic levels, dietary calorie intake, and physical activity.

Aims and objectives

The current study was planned with the objectives of studying obesity among medical students with a focus on determining the prevalence of obesity problem and associated socioeconomic level and lifestyle variables; dietary calorie intake and physical activity.

MATERIALS AND METHODS

The current study is conducted among medical students of all professional years of a Medical College in Central India. The study was done over 3 months. All students enrolled in the MBBS course were considered for inclusion that provided informed consent. Those who had a chronic disease such as thyroid disorders, polycystic ovarian disease, certified physical disability, and known psychiatric and nutritional disorder such as lactose intolerance, anorexia, and bulimia were excluded from the study.

Sampling

First, a list of all the eligible candidates was prepared. As the exact prevalence of lifestyle diseases in students was not known, it was assumed to be 50%. Four hundred students were selected using a random number table from the list of all MBBS students, considering 5% absolute precision with a 95% confidence limit, non-response rate of 10%, and dropout rate of 10%.

The sample size was calculated using the formula $1.96^2 \times PQ/L^2$; where P is prevalence of obesity, Q is (1-P) and L is absolute precision. The calculated sample size was 384 with adding non-response rate of 10% which became 422 and rounding it up to 440. Now, considering a dropout rate of 10% actual adjusted final sample size was 400.

Methodology

Step 1: A List of eligible MBBS students was prepared after applying inclusion and exclusion criterion. Four hundred students were selected using the simple random sampling technique.

Step 2: A pre-tested, semi-structured questionnaire was prepared for the cross-sectional survey, which includes sociodemographic profile, history and examination, body mass index (BMI), SES and Physical Activity Level, and Dietary habits.

Step 3: Students were invited to participate in groups at a convenient time fixed by both participants and the researcher. Faculty members of the concerned department were involved for their guidance and helped arrange these meetings.

Step 4: Data were collected by applying the prepared questionnaire.

Analysis and statistical consideration

BMI was used to identify and the World Health Organization classification was used to categorize the student in nutritional levels as per BMI.[6]

General Practice Physical Activity Questionnaire (GPPAQ) was used to categorize the level of physical activity.[7]

The SES of the study participants was assessed using the Latest Modified Prasad Classification and All India Consumer Price Index.[8]

Dietary assessment was made using the 24 h oral questionnaire method.[9]

Frequencies and percentages were counted and calculated for categorical variables, and the Chi-square test was used for comparison of the data between different categories of students for descriptive analysis.

Ethical consideration

The aims and objectives of the study were explained to the participants, and written informed consent was obtained from each participant. Participants were assured that participation in the study was voluntary and the confidentiality of the information obtained was maintained. The study was purely questionnaire based and did not affect the treatment or routine of patients. The latest updated Principles of Helenski's declaration were followed throughout the study.

RESULTS

A total of 400 participants were interviewed with a mean age of 21 years (19–22, 95%CI). Among the participants, 270 were males and 130 were females. Out of 270 male students, 30 (11.1%) were found to be obese and 30 were pre-obese (11.1%); while none of the 130 females were found to be obese 10 (7.7%) among them were found to be pre-obese. Among the participants, 30 students (7.5%) were found to be obese, while 370 (92.5%) were non-obese.

The participants were categorized using the WHO classification based on BMI (Figure 1). Out of a total of 30 obese students, 4 (1%) were obese Class II and the rest 26 (6.5%) were Class I. Furthermore, among the non-obese students, 10% were found to be in pre-obese categories.

The Physical Activity Level was assessed using the GPPAQ. It was found that 110 (27.5%) students were "inactive" as per physical activity level against 290 (72.5%) students falling in the active category.

Three hundred and fifty students among the participants belonged to upper SES, while only 50 were from lower SES. Dietary calorie intake was found to be adequate, defined by energy requirement estimated as per physical activity level for the individual, for 340 (85%) students out of a total of 400, while 60 (15%) had more than required.

The current study found a relationship of obesity with gender, SES, and physical activity to be statistically significant (Table 1).

Thus, high SES and male gender were found to be probable risk factors for being obese. In addition, these findings are in favor of obesity being possibly caused by physical inactivity.

DISCUSSION

The current study reveals an important aspect of the obesity problem among medical students of central India; not much work has been done to address this problem in this setting. The study also discloses the prevalence of pre-obese and classifies obesity in addition to the overall obesity among the specified population.

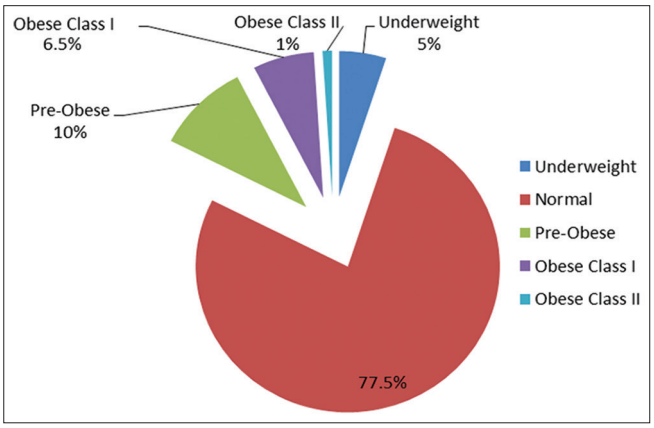

Figure 1: Distribution of study participants according to body mass index

Table 1: Relationship of obesity with gender, SES, and physical activity

Variables	Obese	Non-obese	Total	Chi-square test static
Male	30	240	270	χ^2=15.6
Female	0	130	130	*P*<0.0001
Physically active	5	285	290	χ^2=50.71
Physically inactive	25	85	110	*P*<0.0001
Upper-SES	30	320	350	χ^2=4.633
Lower-SES	0	50	50	*P*=0.0314

SES: Socioeconomic status

A study conducted among undergraduate medical students revealed overall 3.4% of obesity and 17.5% were overweight.[4] In another study among medical students of Delhi for nutritional status and blood pressure 11.7% were overweight.[5] Furthermore, a cross-sectional study of the physical activity habits of young adults; conducted by Banerjee and Khatri found more than 20% of students to be overweight/obese and concluded that the majority of students were physically inactive.[10] In many studies conducted in different geographical areas of India between 2011 and 2022; Medical students and young adults found obesity prevalence in the range of 6.5% and 30.3% obese and pre-obesity/overweight in the range of 13.9–36.8%.[11-15]

It is perceptible that the term pre-obese defined by the WHO is interchangeably used for the overweight in different studies. All these studies indicate that obesity/pre-obesity is becoming a public health problem all over India. Moreover, the chronology of the findings of these studies suggests an increasing trend of obesity prevalence.

The findings of the current study of the prevalence of obesity of 7.5% and pre-obesity/overweight of 10% is in the range found in studies all over India in different settings and hence consistent with these findings applicable in our setting as well.

The findings of our study can be discussed in terms of the prevalence of physical inactivity among obese students, which was 83.3% and the significant relationship thus found between them.

A study conducted among affluent adolescents in Surat city for determining obesity and overweight concluded that physical inactivity is one of the predisposed factors for having overweight/obesity[11] In another study of the prevalence of obesity and overweight among 350 medical students found 88% of physical inactivity among the obese student.[16] In addition, there are many more studies from 2014 to 2023 among medical students that found physical inactivity to be significantly associated with obesity.[17-20]

A study of Indian adolescents for finding the prevalence of obesity/overweight, its relationship with SES and lifestyle revealed a higher obesity associated with higher SES.[21] There are studies that inferred that there is a positive association between obesity with SES even on an India-wide scale.[22,23]

Furthermore, the studies on obesity in medical students with SES as associated factors is lacking which places our study in a distinct position on this issue.

Limitations of the study

The findings of this study are to be interpreted in the light of its observational cross-sectional design and thus

with limitations of not able to suggest a temporal/causal relationship of obesity with study variable requiring further studies with more robust design.

CONCLUSION

The current study concludes that obesity/pre-obesity (which is equivalent to overweight in other study) is an important prevalent problem among medical students with association with sedentary lifestyle and high SES.

The study may recommend screening for all lifestyle diseases. Dietary intervention to reduce the calorie intake along with low cholesterol diets such as encouragement for fruit intake and avoidance of eating out. Lifestyle modification in the form of daily physical exercise, yoga or just walking for pleasure and recreational activities of own liking should be encouraged to decrease stress levels. The study also serves as scaffolding for further inquiry using a more concentrated research method in the forthcoming time.

ACKNOWLEDGMENT

We are grateful to the medical teachers for facilitating the interviews of the participants; without their support this study would not have been possible.

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Source of Support: Nil, **Conflicts of Interest:** None declared.