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Prevalence of overweight and obesity-associated risk factors amongst medical students in South India

Tina J, Yogesh Mohan*, Jayashri D, Timsi Jain

Department of Community Medicine, Saveetha Medical College Hospital, Chennai -602105, Tamilnadu, India

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ABSTRACT

Obesity is defined as an excessive accumulation of body fat to an extent where health is impaired. Obesity among students is progressing towards an epidemic level. The change in lifestyle, lack of physical activity and exercise, improper eating habits and lack of awareness about obesity has become a major problem of college students, especially among medical students. This study was conducted with the objective to estimate the prevalence of overweight & obesity and associated factors. A cross-sectional study was conducted among medical students of Saveetha Medical College and Hospital (SMCH) with a sample size of 230 and a purposive sampling technique was used. Data was collected using a semi-structured questionnaire. Data were entered in Microsoft Excel and analyzed using relevant statistical tests. Prevalence of overweight and obesity was 20.4% and 2.1%, respectively and factors such as diet pattern and sleep duration are significantly associated with overweight and obesity. Measures such as motivating the students, organizing group exercise activities and making physical activity as part of the curriculum and importance of adequate sleep should be emphasized.

*Corresponding Author

Name: Yogesh Mohan
Phone: +919551270101
Email: dr.yogeshmohan@gmail.com

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INTRODUCTION

Obesity is defined as an excessive accumulation of body fat to an extent where health is impaired. Obesity has a broad range of adverse health effects that are independent of adult weight (Kaur, 2014). According to the Indian Council of Medical Research, the prevalence rate of obesity in India varies from 11.8% to 31.3% (NFHS 4, 2016).

In Tamil Nadu, the prevalence rate of obesity among all the adults was 52.4% and females it was ranging from 22.8% to 34.8% and in males, it was ranging from 23.4 to 22% (Murugan and Therese, 2016).

While the majority of the researches done highlight obesity and overweight as problems of the developed countries, recent studies also show that the third world countries are no exception (Moore *et al.*, 2010). Obesity is a risk factor for metabolic syndrome. The other risk factors include increased blood pressure (greater than 130/85 mmHg), high blood sugar levels, excess fat around the waist, high triglyceride levels and low levels of good cholesterol or HDL.

India is experiencing an epidemiological and nutritional transition with the increasing prevalence of non-communicable diseases (NCDs). The conspicuous transition includes increased consumption of animal protein and fat, decreased cereal intake, the proliferation of fast-food restaurants and reduced physical activity (WHO, 2019). Body Mass Index

Table 1: Socio-demographic details of the study participants (n=230)

Age group of the study participants years	n	%
17-20	126	54.7%
21-24	104	45.2%
Gender of the study participants		
Male	104	45.2%
Female	126	54.7%
Present place of residence of the study participants		
Day scholar/Home	139	60.4%
Hostel	91	39.5%
Adequacy of Exercise (WHO recommendation)		
Adequate	108	46.9%
Inadequate	122	53%
Diet pattern of study participants		
Veg	80	34.7%
Mixed	150	65.2%
Consumption of junk food among study participants		
Yes	211	91.7%
No	19	8.2%
BMI categories of the study participants		
Underweight(below 18.5)	9	3.9%
Normal(18.5-24.9)	169	73.4%
Overweight(25-29.9)	47	20.4%
Obese(above 30.0)	5	2.1%
History of smoking among study participants		
Yes	9	3.9%
No	221	96%
Consumption of alcohol among study participants		
Yes	15	6.5%
No	215	93.4%
Approximate duration of sleep among study participants		
<8 hrs	164	71.3%
>8 hrs	66	28.6%
Family history of DM, HTN among study participants		
Yes	28	12.1%
No	202	87.8%

(BMI) is an indicator of body obesity.

If BMI is 25.0 to 30, it falls within the overweight range. If BMI is 30.0 or higher, it falls within the obese category. Obesity among students is progressing towards an epidemic level. The change in lifestyle, lack of physical activity and exercise, improper eating habits and lack of awareness about obesity which has become a major problem of college students, especially among medical students who have a stressful schedule and are more prone to NCDs. So the present study was undertaken in Saveetha Medical College and Hospital to estimate the prevalence of overweight and obesity and associated risk factors.

MATERIALS AND METHODS

A cross-sectional study was carried out among the medical students of Saveetha Medical College and Hospital for the study duration of 3 months. A sample size of 230 was calculated using the formula $4pq/r^2$. Where p = 29.5 (Ahirwar and Mondal, 2019), r = 20% of p. The study participants were selected using a purposeful sampling technique. All the students who gave informed consent to participate in the study were included. A semi-structured

Table 2: Univariate Logistic Regression Analysis (n=230)

		Obesity and Overweight					
Variables	Category	No	Yes	p-value	OR	95% CI	
Residence	Hostilities	68	24	0.304	1.387	0.743	2.586
	Day Scholars	110	28	–	Ref		
Sleep	< 8 hours	121	43	0.043	2.251	1.027	4.932
	> 8 hours	57	9	–	Ref		
Recommended Exercise	Yes	86	21	–	Ref	0.737	2.583
	No	92	31	0.314	1.380		
Diet	Vegetarian	71	10	–	Ref	1.314	5.912
	Mixed	107	42	0.008	2.787		
Smoking	Yes	6	3	0.438	1.755	0.423	7.274
	No	172	49	–	Ref		
Junk food consumption	Yes	162	48	0.771	1.185	0.378	3.713
	No	16	4	–	Ref		
Family history of obesity	Present	18	9	0.161	1.860	0.781	4.432
	Absent	160	43	–	Ref		

Table 3: Multivariate Logistic Regression Analysis (n=230)

		Obesity and Overweight					
Variables	Category	No	Yes	p-value	OR	95% CI	
Residence	Hostilities	68	24	0.067	1.906	0.955	3.803
	Day Scholars	110	28	–	Ref		
Sleep	< 8 hours	121	43	0.021	2.665	1.163	6.108
	> 8 hours	57	9	–	Ref		
Recommended Exercise	Yes	86	21	–	Ref	0.617	2.306
	No	92	31	0.599	1.193		
Diet	Vegetarian	71	10	–	Ref	1.371	6.962
	Mixed	107	42	0.007	3.089		
Smoking	Yes	6	3	0.363	2.031	0.441	9.359
	No	172	49	–	Ref		
Junk food consumption	Yes	162	48	0.957	1.036	0.288	3.726
	No	16	4	–	Ref		
Family history of obesity	Present	18	9	0.135	2.016	0.804	5.053
	Absent	160	43	–	Ref		

questionnaire was used for data collection using interview techniques.

The data was collected using a semi-structured questionnaire during May-June 2018 and was entered into the Microsoft Excel sheet. The analysis was done using Epi-Info software and relevant statistics such as proportions and chi-square; logistic regression was used for data analysis. A p-value of less than 0.05 was considered statistically significant. Institutional Ethical Committee approval was taken before starting the study.

Operational definitions

Adequate exercise

According to Global strategy on a diet, physical activity and Health, Adults aged 18–64 should do at least 150 minutes of moderate-intensity aerobic physical activity throughout the week or do at least 75 minutes of vigorous-intensity aerobic physical activity throughout the week or an equivalent combination of moderate- and vigorous-intensity activity (WHO, 2019).

Junk food

Junk food is energy-dense food with a high amount of refined sugar, white flour, trans-fat, polyunsatu-

rated fat, salt, numerous additives and low nutrient value in terms of protein, fibre, vitamin, and mineral content. Foods like chips, chocolate, soft drink, etc. are generally taken as junk food (Kaushik *et al.*, 2011).

Current tobacco users

According to (GATS) Global Adult Tobacco Survey 2010, the constituents of smoking will include using smoked cigarettes, smoked water pipes, smoked water pipes (WHO, 2010).

Anthropometric measurements like height (in meters) and weight (in kilograms) of the subjects were undertaken by means of stadiometer and weighing machine, respectively.

BMI is calculated by the formula;

$$BMI = \frac{Weight\ (kg)}{Height\ (m)^2}$$

RESULTS AND DISCUSSION

The prevalence of overweight was 20.4% (Table 1) and obesity was 2.1% in the current study was lower compared to the study done by Mohan V et al. (Mohan *et al.*, 2015) the difference may be due that fact that our study focuses only on medical students and time duration between the two studies.

It was observed that the prevalence of obesity was less among those study participants who consumed vegetarian food (Table 1), which is similar to the study conducted by Newby P (Newby *et al.*, 2005).

Although study participants who did inadequate exercise were more overweight as compared to those who did adequate exercise (Table 1), the differences were not statistically significant. This is contrary to the results observed by Miles J L (Miles *et al.*, 2009), the differences may be due to the fact that study participants may have exaggerated their exercise duration.

Sleep was a significant contributor of overweight and obesity in our study (Table 1) which is similar to the study conducted by Gangwisch J E (Gangwisch *et al.*, 2005) in the year 2005 observed an increase in the prevalence of obesity with day time sleep and inadequate sleep during the night.

Table 2 shows that upon univariate analysis of the various factors which are assumed to be contributing to overweight and obesity, factors such as sleep and diet were independently associated with overweight and obesity. However, factors such as residence, smoking habit, junk food consumption, and family history of obesity were not independently associated with overweight and obesity.

Multivariate logistic regression was performed (Table 3) to ascertain the effects of place of residence, sleep duration, recommended exercise, diet, smoking, junk food consumption, family history of obesity, on the likelihood that participants become overweight and obesity. The logistic regression model was statistically significant i.e. chi-square value = 19.154, df =9, p=0.008. The model explained 12.2% (Nagelkerke R2) of the variance in becoming overweight and obese and correctly classified 77.10% of overweight and obese individuals. Individuals who sleep less than 8 hours a day were 2.6 times more likely to become obese and individuals on a mixed diet were 3 times more likely to become overweight and obese than individuals who are on a vegetarian diet.

CONCLUSION

In the present study, the prevalence of overweight and obesity was 20.4% and 2.1%, respectively and factors such as diet pattern and sleep duration are significantly associated with overweight and obesity. Measures such as motivating the students, organizing group exercise activities and making physical activity as part of the curriculum and importance of adequate sleep should be emphasized.

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