

**SCREENING OF COLLEGE STUDENTS FOR OBESITY****SOHEL MEMON\*, VINEELA NEKKANTI, RAVINANDAN AP, SRINIVASAN R, APOORVA DEV, SANJAY SHARMA**

Department of Pharmacy Practice, PES College of Pharmacy, Bengaluru, Karnataka, India. Email: sohel\_memon@hotmail.com

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**ABSTRACT**

A prospective, cross-sectional study on the prevalence of overweight and underweight among students at an institute in Bengaluru, was conducted by estimating their body mass index. The study was carried out on 121 students in the age group of 14-28 years. Of 121 students, 35 (28.92%) were underweight, 73 (60.33%) were normal weight and 13 (10.74%) were overweight. Based on the age group, 14-20 years of age group, 28 (38.8%) were underweight, 48 (55.5%) were normal weight and 4 (5.5%) were overweight. In age group of 21-25 years, 7 (15.5%) were underweight, 32 (71.11%) were normal weight and 6 (13.33%) were overweight and in age group 25-28 years, 0 (0%) were underweight, 1 (25%) were normal weight and 3 (75%) were overweight. The study concludes that the prevalence of underweight is higher than overweight among the college students.

**Keywords:** Prevalence, Overweight, Underweight and Body mass index.**INTRODUCTION**

Body mass index (BMI) is a measure of weight adjusted to a height, calculated as weight in kilogram divided by a square of height in meter and expressed in kg/m<sup>2</sup> [1]. Often BMI is considered as indicator of body fatness, it is a surrogate measure of body fat because it measures excess weight rather than excess fat [1]. BMI is a simple inexpensive and non-invasive alternative measure of body fat [1].

High BMI envisages future morbidity and death. Hence, BMI is an appropriate measure for screening for obesity and its health risks [1]. Basically BMI does not distinguish between excess fat, muscle or bone mass, nor does it provide any indication of the distribution of fat among individuals [1].

BMI does not measure body fat directly. Therefore it should not be used as a diagnostic tool. Instead, BMI should be used as a measure to track weight status in populations and as a screening tool to identify weight problems in individuals [1].

Obesity means an abnormal growth of adipose tissue due to an enlargement of fat cell size. It is more prevalent form of malnutrition in both developed as well as many developing countries. Commonly, obese are at more risk of man-made disease or health conditions such as hypertension, Type 2 diabetes mellitus, cardiovascular (CVS) diseases, stroke, gall bladder disease, osteoarthritis, sleep apnea and respiratory problem and certain types of cancers (breast, colon, endometrial). Basically, active individuals require more calories compare to less active ones. It is believed that obesity increases in the last 25 years of life, due to decreased level of physical activities in everyday life.

BMI surveillance program conducted to assess the weight status of a specific population (i.e. college students) and to find out the percentage of students who are potentially at risk for weight related health problems. BMI is a vital and highly widespread condition in the world.

The world development report revealed that an increase in the intake of the fat, saturated fat, sugar, salt and vegetable ghee (clarified butter) in India [4].

**METHODS**

A prospective, cross-sectional study was conducted at People's Education Society (PES) Institute, Bengaluru, Karnataka. The study

was conducted on students of different departments including pre-university, degree and pharmacy colleges.

Data collection tool was developed, which includes demographics, unique identification code, dietary habit, physical activity and measurement of BMI.

BMI was measured by an Android app: BMI calculator.

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

Weight was measured in kilograms after removal of shoes while wearing light clothes on mechanical weighing scale (model: Krups imperial).

Height was measured in meters using wall tape without shoes by maintaining straight body posture with arms hanging freely.

BMI was categorized by standard classification as Table 1.

The collected data were summarized using suitable statistical method.

**RESULTS****Prevalence of obesity based on BMI**

Among 121 students 35 (28.92%) students were underweight, 73 (60.33%) normal and 13 (10.74%) were overweight (including pre-obese 11 [9.09%], obese Class I 1 [0.82%] and obese Class II 1 [0.82%]) (Table 2).

**Table 1: WHO classification of BMI**

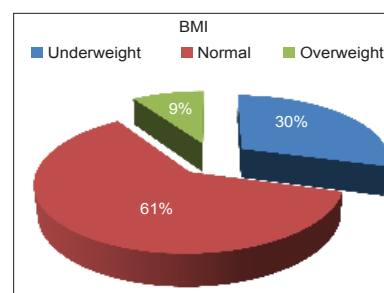
Classification	BMI (kg/m <sup>2</sup> )
Underweight	<18.50
Normal range	18.50-24.99
Overweight	≥25.00
Pre-obese	25.00-29.99
Obese	≥30.00
Obese Class I	30.00-34.99
Obese Class II	35-39.99
Obese Class III	≥40

BMI: Body mass index

**Table 2: Prevalence of underweight and overweight as per BMI**

Category of BMI	N (%)	Gender (%)	
		Male	Female
Under weight	35 (28.92)	21 (60)	14 (40)
Normal range	73 (60.33)	48 (65.75)	25 (34.25)
Over weight	13 (10.74)	11 (84.61)	02 (15.39)
Pre-obese	11 (9.09)		
Obese Class I	1 (0.82)		
Obese Class II	1 (0.82)		
Obese Class III	0 (0.00)		

BMI: Body mass index

**Fig. 1: Prevalence of under, normal and overweight as per body mass index****Table 3: Prevalence of underweight and overweight based on age**

Age (years)	N (%)	Over weight				
		Under weight	Normal weight	Pre-obese	Obese Class I	Obese Class II
14-20 (N=72)	28 (38.88)	40 (55.5)	4 (5.5)	0	0	0
21-25 (N=45)	7 (15.5)	32 (71.11)	5 (11.11)	0	1 (2.22)	0
>25 (N=4)	0	1 (25)	2 (50)	1 (25)	0	0

**Prevalence of BMI according to age**

In Class I, age 14-20 years 28 (38.88%) were underweight, 40 (55.5%) were normal and 4 (5.5%) were obese.

In Class II, age 21-25 years 7 (15.5%) were underweight, 32 (71.11%) were normal and 5 (11.11) were obese.

In Class III, age >25 years 1 (25%) was normal and 3 (75%) were obese (Fig. 1 and Table 3).

**DISCUSSION**

Underweight and obesity are the common health conditions in developed as well as in developing countries.

Inadequate intake, excessive losses, malabsorption, increased requirement, body image and self-esteem level leads to underweight.

Many factors facilitates progression to obesity like sedentary lifestyle, increased junk food consumption, decreased physical activity, high use of smart gadgets, improper diet habits, social history such as smoking and alcohol and improper sleep patterns.

The present study was an attempt to identify, assess and aware weight related status in college students, by measuring their BMI.

In one of the studies conducted in nursing students, prevalence of obesity was found to be 9.16% and underweight 9.56%.

In another study conducted on medical students at Lahore Medical and Dental College, the prevalence of underweight 6%, normal weight 60%, overweight 27% and obese 7%, where as our results of the present study observed that much higher prevalence of underweight 28.9% than normal 60.33% and overweight 10.74%.

**CONCLUSION**

The current study shows the prevalence rate of underweight is higher than overweight among college students. Poor management of underweight lead to complications such as weakened immune system, poor physical stamina, pregnancy complications and menstrual abnormalities in females and osteoporosis. On the other hand, poor management of obesity leads to CVS disorders, cancer, diabetes mellitus, gall bladder disease, endocrine and metabolic disturbances,

osteoarthritis, gout and pulmonary disease. Hence, educating the students about nutritious diet plays a vital role to maintain good health.

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