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Original Research Article

The Body Mass Index Patterns in Indian Collegiate Students

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ABSTRACT

College based BMI measurement has been predicted as a potential approach to address obesity among youth. However, little is known about its impact or effectiveness in changing obesity rates or related physical activity and dietary behaviours that influence obesity. BMI measurement in colleges may be conducted for surveillance and screening of weight status, because it is relatively easy to measure and correlates with body fat. This study included 105 students of both sexes (52 females and 53 males) selected from Rajeev Gandhi College, Bhopal, India using non-probability purposive sampling method. This case study describes current BMI-patterns and provides guidance on implementing such an approach.

Keywords: Body mass index, Body fat, Obesity, physical activity, weight status

INTRODUCTION

BMI is the ratio of an individual's weight to height squared (kg/m^2) and is used to estimate a person's risk of weight-related health problems. It is often used to assess weight status, because it is relatively easy to measure and correlates with body fat. [(1-5)] After BMI is calculated it is plotted by age on a gender specific growth chart. BMI measurement in colleges may be conducted for surveillance and screening purposes. A number of concerns have been expressed about college based BMI screening programs, Including that they might intensify the stigmatization already experienced by many obese youth, increase dissatisfaction with body image, and intensify pressures to engage in harmful weight-loss practices that could lead to eating disorders. [(6-15)] There are many researches which have studies related to obesity in school going children in India but very few have shown the current habitus of obesity in college going students. Therefore the present research was directed towards determining the patterns of body built in collegiate students of India. More research is needed to assess the validity of these concerns. BMI surveillance programs are less controversial, because they do not involve the communication of sensitive information and do not require follow-up care.

MATERIALS AND METHODS

This study was done at Rajeev Gandhi College, Bhopal, India during the period from 15th March 2017 to 20th January 2018. A convenient sample of 105 collegiate students of both sexes of age group 17- 23 years were chosen using non-probability purposive sampling method. Objectives of the study were explained to participants. They were segregated in two

groups; that is group A (female) group and Group B (male group). They were assured that information obtained would be anonymous and confidential. Data were collected using a questionnaire designed for the purpose of the study. It included socio-demographic information (name, age and sex). Those who were involved in active muscle training exercises and those who had a history of fracture in the past 3 months, a deformity, or pain at rest or movement in the upper arms were excluded. To identify the baseline prevalence and trends in student's obesity locally, we analyzed height and weight data for students in Rajeev Gandhi College through first year to final year.

Height was measured to the nearest centimetre using a stadiometer pole while the subject is in standing position without footwear and heals together. The weight was measured to the nearest 0.5 Kg, with light clothes and without footwear, by using a portable digital weighing scale. The body mass index (BMI) was calculated using Quetelet's index. [(12)]

The Ethical Committee of Rajeev Gandhi College, Bhopal approved the study. Each participant voluntarily provided written informed consent before participating. Statistical analysis was done using SPSS Version 23 (IBM Corp., Chicago, Illinois, USA). The results were presented in tables and graphs.

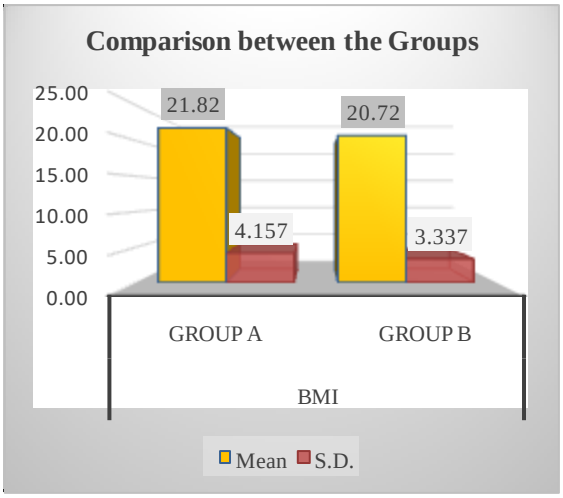
RESULTS

According to this study majority of both males and females fall into normal weight category as well as Normal Body mass index in Indian collegiate population.
The descriptive data has been tabulated and graphically shown in Table 1- 4 and Graph 1-7.

The below table describes Mean and SD values of BMI of females (group A) and males (group B) and their ranges. Mean value of BMI of group A is 21.82±4.16 and of group B is 20.72 ± 3.34. The ranges of both the groups are similar. In group A BMI range is 16 and in group B range is 15.4. Comparison of the mean values using unpaired t- test indicates no significant difference.

TABLE NO 1: DESCRIPTION OF BMI COMPARISON BETWEEN THE GROUPS

Unpaired T Test	BMI	
	Group A	Group B
Mean	21.82	20.72
S.D.	4.157	3.337
Number	52	53
Maximum	36.8	29.3
Minimum	16	15.4
Range	20.8	13.9
Mean Difference	1.10	
Unpaired T Test	1.492	
P value	0.1387	
Table Value at 0.05 df 103	1.98	
Result	Not-Significant	



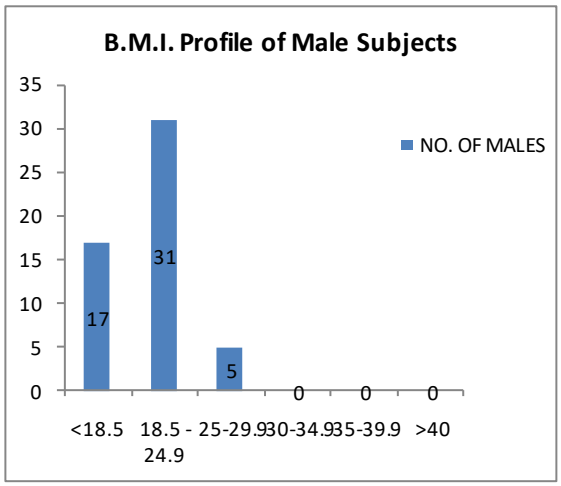
GRAPH 1: DESCRIPTION OF BMI COMPARISON BETWEEN THE GROUPS

The above graph shows comparison of Mean and SD values of BMI of group A and group B.

TABLE 2: B.M.I. PROFILE OF MALE SUBJECTS

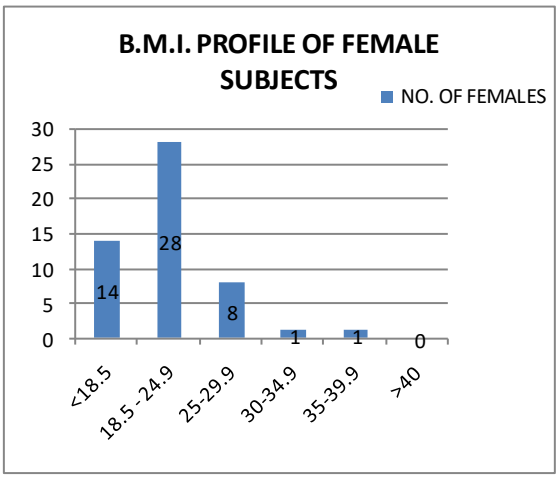
LEVEL	NO. OF MALES	PERCENTAGE OF SUBJECTS
<18.5	17	32.07%
18.5 – 24.9	31	58.49%
25-29.9	5	9.43%
30-34.9	0	0%
35-39.9	0	0%
>40	0	0%

The above table shows number and percentage of male subjects in various categories of BMI index.



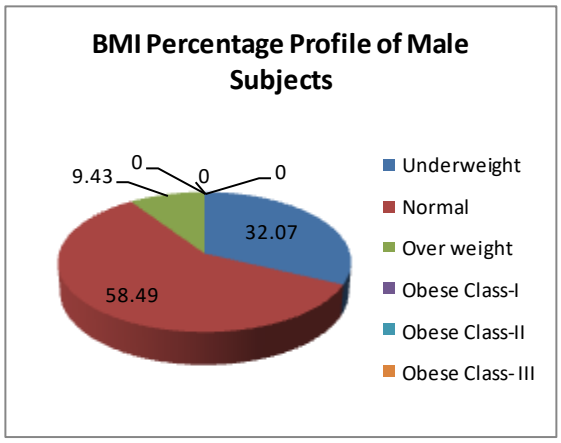
GRAPH 2: B.M.I. PROFILE OF MALE SUBJECTS

The above graph shows number of male subjects in various categories of BMI index.



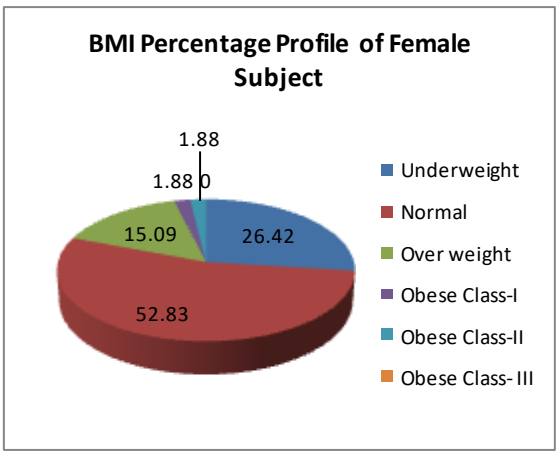
GRAPH 4: B.M.I. PROFILE OF FEMALE SUBJECTS

The above graph shows number of female subjects in various categories of BMI index.



GRAPH 3: B.M.I. PERCENTAGE PROFILE OF MALE SUBJECTS

The above graph shows percentage of male subjects in various categories of BMI index.



GRAPH 5: B.M.I. PERCENTAGE PROFILE OF FEMALE SUBJECTS

The above graph shows percentage of male subjects in various categories of BMI index.

TABLE 3: B.M.I. PROFILE OF FEMALE SUBJECTS

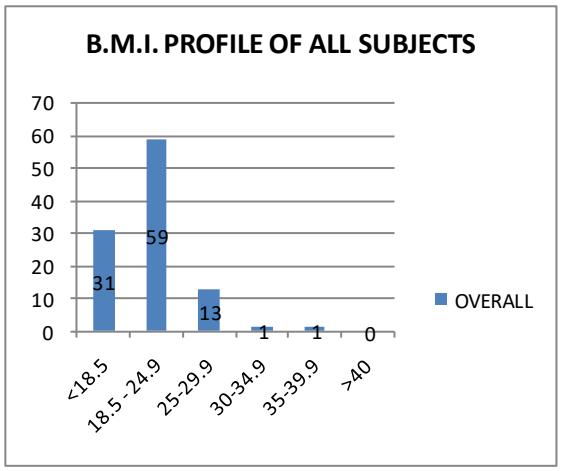
LEVEL	NO. OF FEMALES	PERCENTAGE OF SUBJECTS
<18.5	14	26.42%
18.5 - 24.9	28	52.83%
25-29.9	8	15.09%
30-34.9	1	1.88%
35-39.9	1	1.88%
>40	0	0%

The above table shows number and percentage of female subjects in various categories of BMI index.

Table 4: B.M.I. PROFILE OF ALL SUBJECTS

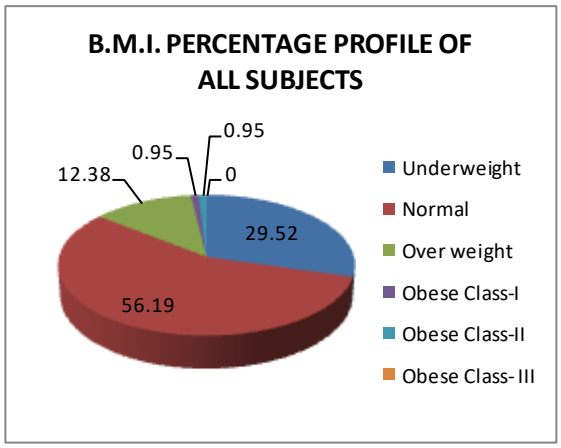
Level	Class	Overall	Percentage
<18.5	Underweight	31	29.52%
18.5 - 24.9	Normal	59	56.19%
25-29.9	Overweight	13	12.38%
30-34.9	Obese class-I	1	0.95%
35-39.9	Obese class-II	1	0.95%
>40	Obese class-III (Morbid obesity)	0	0%

The above table shows number and percentage of all subjects in various categories of BMI index.



GRAPH 6: B.M.I. PROFILE OF ALL SUBJECTS

The above graph shows number of all subjects in various categories of BMI index.



GRAPH 7: B.M.I. PERCENTAGE PROFILE OF ALL SUBJECTS

The above graph shows percentage of all subjects in various categories of BMI index.

DISCUSSION

Studies have not yet adequately evaluated the utility of college based BMI measurement programs in preventing increases in obesity among youth. A few jurisdictions have monitored the prevalence of obesity through childhood obesity interventions that include BMI screening; however, the independent effects of the BMI screening program on obesity are not clear. [16-18] Arkansas is evaluating the impact of its multi component, childhood obesity program that includes a state wide BMI-screening and –surveillance program. The percentage of Arkansas students classified as obese was 20.8% in 2003–2004, the first year of implementation, 20.7% in 2004–2005, 20.4% in 2005–2006 and 20.4% in 2006–2007, and 20.5% in 2007–2008.38 A small body of research has addressed issues related to college based BMI-measurement programs including perceptions of weight status, parental perceptions of BMI-screening programs. Additional research is needed on possible psychosocial effects of BMI screening on students.

According to this study the majority of both males and females fall into normal weight category in Indian population. The reason for this may be attributed to body-image attitudes, body-image perceptions, weight concerns and eating behaviours, and judgments of the thinness-fatness of varying body sizes. [19]

CONCLUSION

Both Males and females are of normal weights in college going population in India. The study found that anthropometric variable BMI has significance as according to gender variations.

ACKNOWLEDGEMENTS

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Authors' Contributions

Dr. D. Vijay Kumar provided the set-up for the study. Prachi Sathe and Abhinav Sathe planned and conducted the study.

Conflicts Of Interest: There are no conflicts of interests.

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