

ESTIMATION OF BODY MASS INDEX AMONG FIRST YEAR UNDERGRADUATE DENTAL STUDENTS IN AN UNIVERSITY TEACHING HOSPITAL AT CHENNAI

Type of study: Original research
Running title: Estimation of body mass index

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ABSTRACT -

Background: Body mass index (BMI) is a value derived from the mass (weight) and height of a person. The BMI is a convenient rule of thumb used to broadly categorize a person as underweight, normal weight, overweight, or obese based on tissue mass (muscle, fat, and bone) and height.

Methods: The study was conducted among 100 first year undergraduate dental students, during the month of February 2021. Students belong to the age group of 17 to 20. No personal identifiers were collected. Participants were asked to fill a consent form and a proper awareness of the study was given. The data collected were analysed using SPSS software version 23. Chart analysis was carried out with data collected in software and results were represented in pie charts and bar graphs.

Results: The study involved 54% male and 46% female participants. From the study it was evident that about 25.5% of the participants were found to be overweight and 14.3% of the participants were found to be underweight.

Conclusion: From the present study it can be concluded that there is an increased variance in BMI seen among females than in males. The progressive increase in the mean BMI among females is alarming as the BMI depends on sex and generally less among women.

KEYWORDS - Novel technique, Body mass index (BMI), obesity, overweight, fat, physical fitness, lifestyle, innovative

INTRODUCTION -

The body mass index is basically used as a correlation between groups related by general mass and can serve as a vague means of estimation of adiposity. Generally, the index is used for measuring trends between sedentary and overweight individuals since there is only a small margin of error(1). Body mass index has been used as a standard for recording obesity statistics by WHO (World Health Organisation) since early 1980 s.(2)

Obesity has become a world wide faced problem with more than one billion overweight along with 300 million clinically obese adults. It has a social, psychological and physical consequence, affecting virtually all ages and socio-economic groups. It has been a major contributor to the global strain of chronic diseases and disabilities.(3)

The prevalence of overweight and obesity, basically measured as body mass index, has increased dramatically over the past decade. There is an observed increase in BMI within all ages.(2,4). Obesity and being overweight can put the individual at risk for a number of health issues, including diabetes, heart disease, and some cancers.

Excess weight during pregnancy can cause short- and long-term health issues for both the mother and the infant(5). In the United States, heart disease and stroke are the primary causes of death and disability. Overweight people are more likely than non-overweight people to have elevated blood pressure, which is a significant risk factor for heart disease and stroke(6). High cholesterol levels in the blood can cause heart disease and are often related to obesity. Angina is worsened by being overweight(7).

Over the past 10 years, there has been a decrease in physical activity among younger individuals. Regular exercise or physical activity is an important part of a healthy lifestyle (8). Being obese also increases the risk of heart problems, stress, cancer, etc...(9). Calculation of BMI is not a cumbersome process, it only requires two basic parameters - height and weight in meters and kilograms respectively. The formula for calculating BMI :

$$\text{BMI} = \text{Weight (Kg)} / [\text{Height (m)}]^2$$

Based on the values obtained the person can be placed under their categories respectively, ie; underweight, healthy and overweight, obese.

Our team has extensive knowledge and research experience that has translate into high quality publications (10),(11),(12),(13),(14),(15),(16),(17),(18),(19),(20),(21),(22),(23),(24),(25),(26),(27),(28), (29)

On the primary aspect, the study focuses on the estimation of body mass index among the first year undergraduate dental students in Chennai.

MATERIALS AND METHODS -

The study was conducted among 100 first year under-graduate students of SAVEETHA dental college, Chennai. The study was conducted during the month of February 2021. The age of participants was between 17 and 20.

No personal identifiers were collected. Participants were asked to sign the consent form after giving a proper awareness regarding the study. The height and weight of the students were manually measured and recorded. With these two data the BMI was calculated. After the study, a proper counselling regarding the relation between diet , daily routines and their effect on BMI was given.

These three data were then copied in Microsoft Excel and tabulated. They are then coded along with their age and gender and are processed further under SPSS software version 23. The output had the complete results along with pie charts, bar graphs and statistical descriptive analysis. Analysis was carefully studied and they were compared with their age, gender and food habits. The P values less than or equal to 0.05 on two sided tests were considered statistically significant.

RESULTS -

The study involved 54% male and 46% female participants (Figure 3). Equal number of participants from both the sexes decreases the study bias based on sex. The participants fall under the age category of 17 years, 18 years, 19 years and 20 years on an average of 12%, 51%, 30% and 7% respectively (Figure 1). Though the study is among first year undergraduate students, varying age groups were seen among them.

The average BMI among different age groups was found to be 23.01 kg/m², 22.86 kg/m², 24.02 kg/m² and 24.04 kg/m² for the ages 17, 18, 19 and 20 years respectively (Figure 4). 14.3% of the participants fall under underweight category, 51% of the participants belong to normal weight category, 25.5% of the participants were overweight category and 9.2% of them belong to obese category (Figure 2).

The average BMI among participants was 23.63 kg/m². and 22.94 kg/m² for males and females respectively (Figure 5). BMI usually differs based on sex and there was no significant difference in the average BMI between males and females in the current study. This finding has to be noted and further research needs to be conducted.

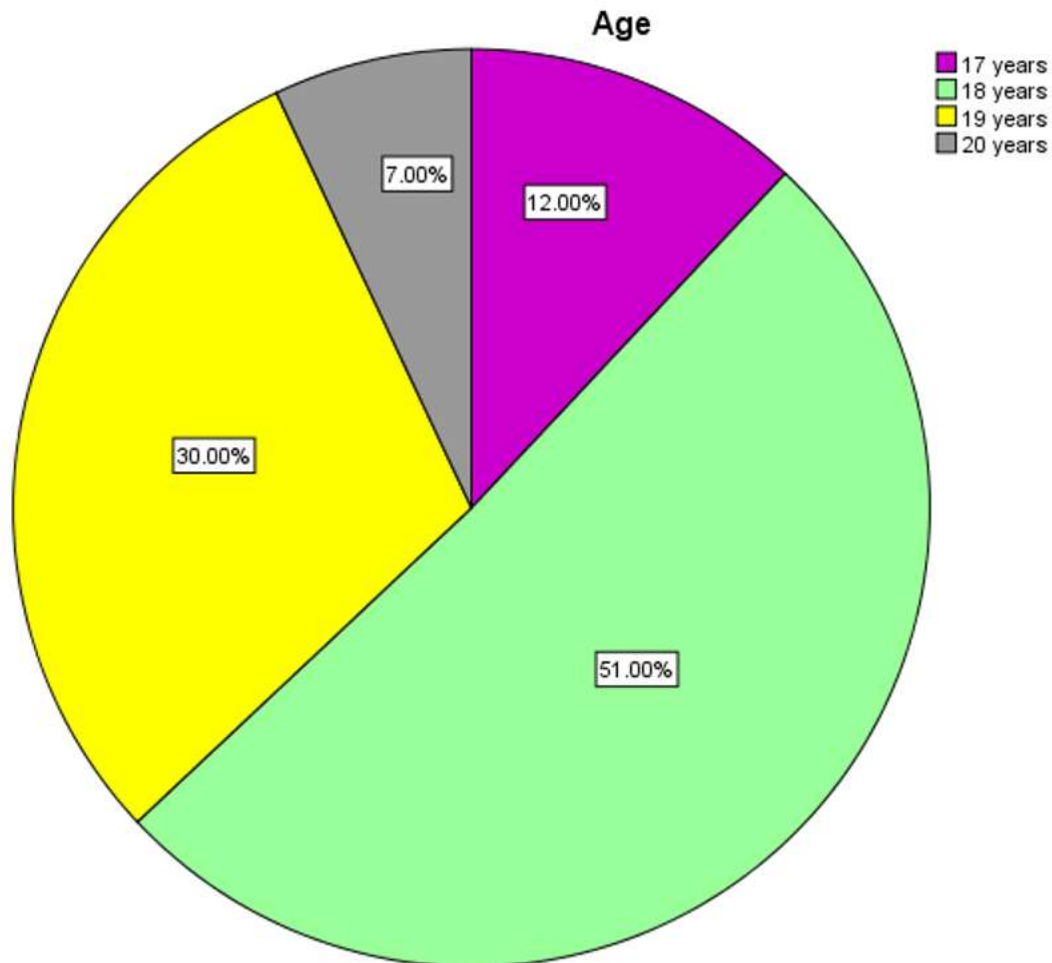


FIGURE 1: Pie chart representing the response of the age distribution among the participants of the study. 12% of the participants belonged to the age of 17 years (Blue), 51% of the participants were of 18 years (Red), 30% of the participants were of the age 19 years (Yellow) and 7% of the participants were of age 20 years (Green).

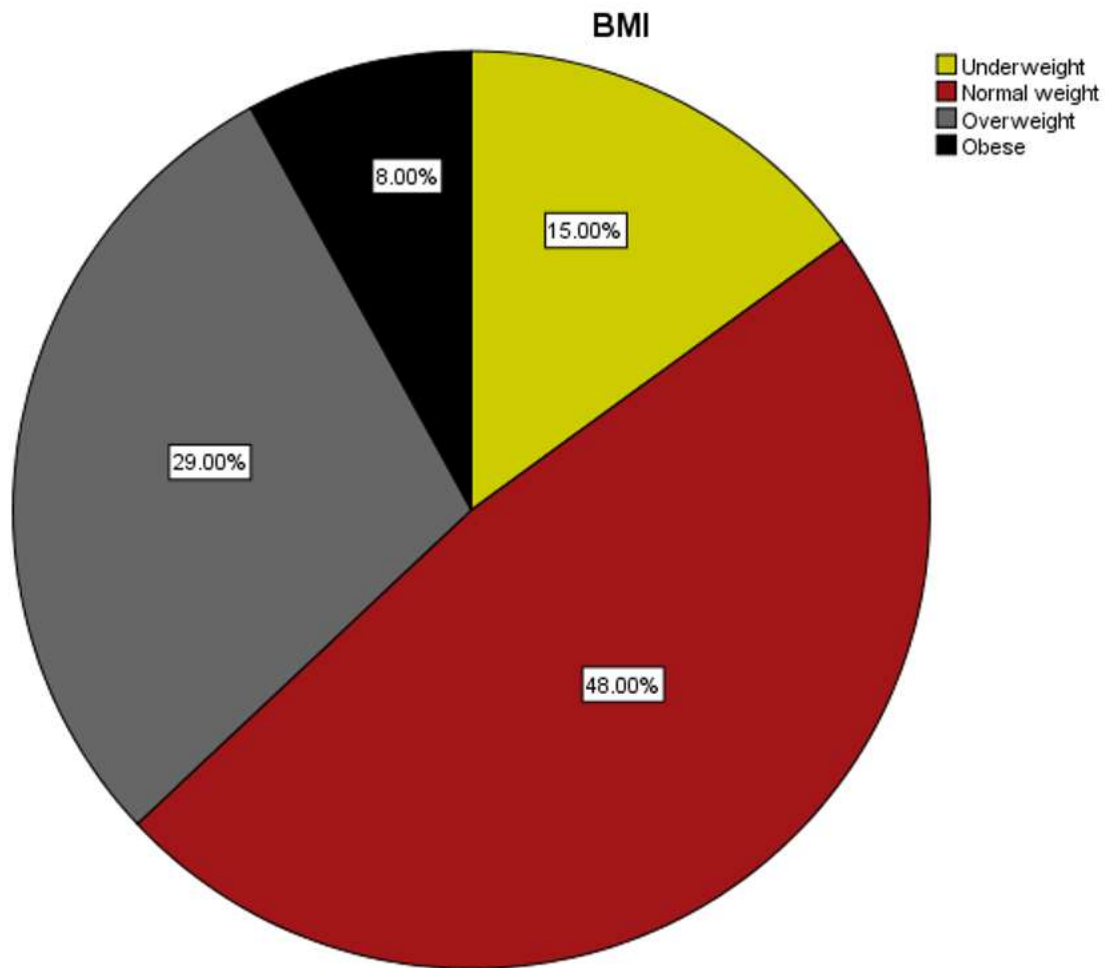


FIGURE 2: Pie chart representing the BMI calculated using the recorded weight and height of the participants. 14.3% of the participants fall under underweight categoryn (Blue), 51% of the participants belong to normal weight category (Red), 25.5% of the participants were overweight category (Yellow) and 9.2% of them belong to obese category (Green).

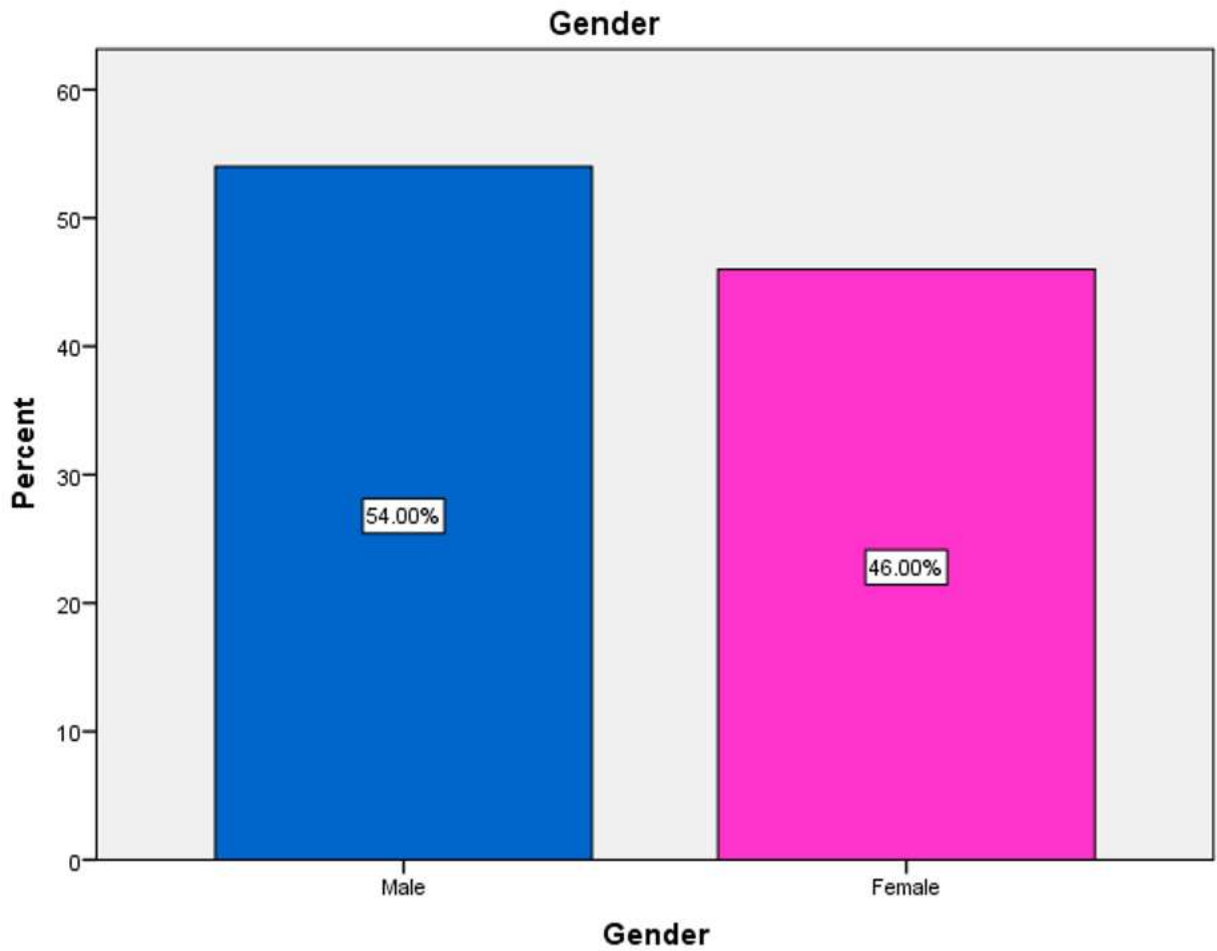


FIGURE 3: Bar graph representing the response of gender distribution among the participants of the study. X-axis represents gender distribution and Y-axis represents percentage of response of the participants. 54% of the participants were males (Yellow) and 46% of the participants were females (Purple).

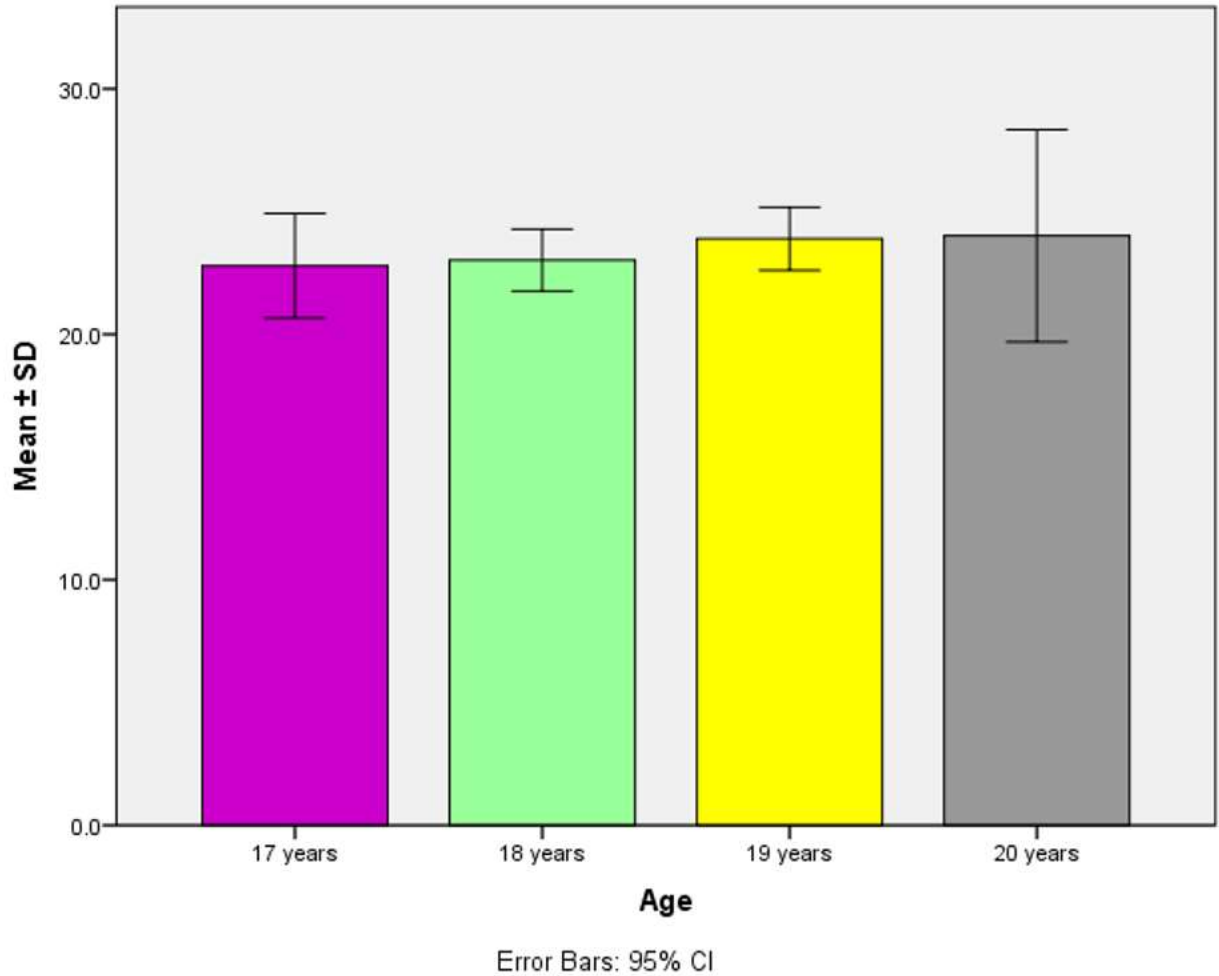


FIGURE 4: Shows a bar graph representing the association between the age group and the mean BMI calculated of the participants. X-axis represents age group and Y-axis represents mean \pm SD of the BMI calculated of the participants. 17 years had mean BMI of 23.01kg/m², 18 years had mean BMI of 22.86kg/m², 19 years had mean BMI of 24.02kg/m² and 20 years had mean BMI of 24.04kg/m².

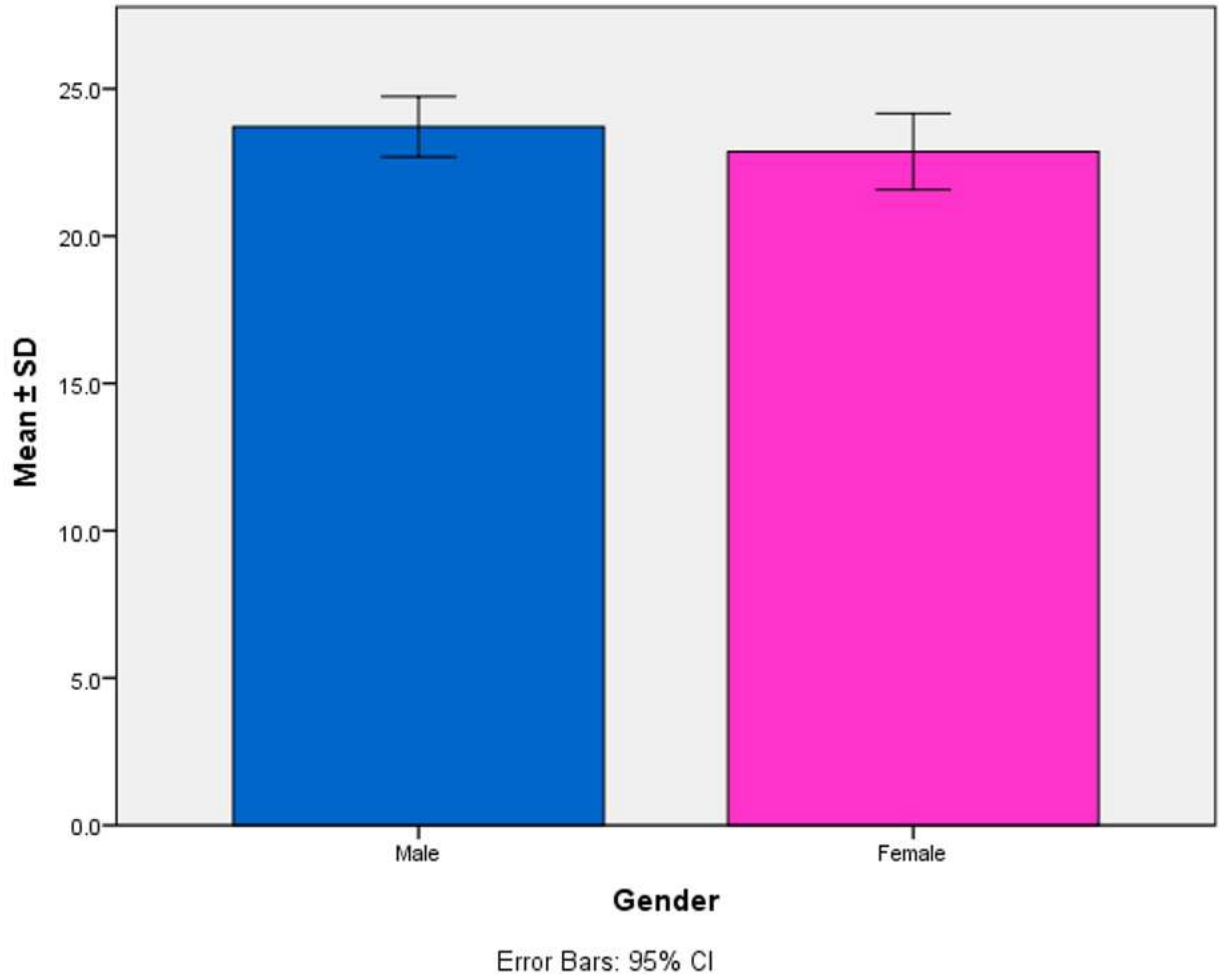


FIGURE 5: Bar graph representing the association between the gender distribution and the mean \pm SD of the BMI calculated of the participants. X-axis represents gender distribution and Y-axis represents mean \pm SD of the BMI calculated of the participants. Males had a mean BMI of 23.63kg/m² and females had a mean BMI of 22.94kg/m².

DISCUSSION -

The linear trend for BMI by year was not significant for both male and females. From the previous study, it has been documented that there has been a variance in BMI of 11.1% among male and 17.1% among females (30,31). This is alarming and coincides with our current study too, where the recorded BMI for male and female on an average was found to be 23.63 kg/m² and 22.94 kg/m² respectively. BMI usually differs based on sex with females normally having less BMI than males owing to their reduced muscle mass. From the current research, a drastic increase in BMI among females which is almost nearing that of male needs attention. Also, it requires proper counselling and further research.

From the study it was evident that about 25.5% of the participants were found to be overweight and 14.3% of the participants were found to be underweight. Among the participants who were overweight, there were an equal number of males and females but the participants belonging to underweight were predominantly females. This finding is in accordance with the already recorded increased variance seen among females. This gives a clarity that the female population who belonged to the category of underweight are gradually moving into the overweight category.

A proper awareness to all the participants was given. Knowledge on the relation between the BMI, proper diet and lifestyle was given to the participants. There was a small drop in the mean BMI found among the

participants who belong to 18 years of age , may be due to their shift in lifestyle, which is in correlation with the previous finding (3).

One of the problems with body mass index is that there is no clear view whether the individual is heavily muscled or overweight(32). To solve this problem, a more specific and accurate measurement of body fat percentage has been recommended. There has been a significant linear trend between the percentage body fat and the years for males and females.

There are a few limitations to be focused. We did not measure physical activity, exercise and dietary intake. These factors differ among individuals. The characteristics of the study participants and general population do not coincide. The present study is limited by lack of comparison with control groups and diagnostic evaluation. The sample size in the present study was relatively small and we had not conducted any formal diagnostic evaluation. In future, this study should be done on a large scale population for better results.

The participants of the study are basically from urban areas which leaves the rural population unnoticed. Further studies are to be conducted among a broader population irrespective of age, sex, locality of living (urban/rural) and lifestyle.

CONCLUSION -

From the present study it can be concluded that there is an increased variance in BMI seen among females than in males. The progressive increase in the mean BMI among females is alarming as the BMI depends on sex and generally less among women. Further research is needed in this aspect so as to increase an awareness on the importance of BMI and general health. The study thus suggests that there is a need to expand efforts of wellness programs, awareness camps and health initiatives to promote healthy lifestyle among students.

Conflict of Interest :

The authors hereby declare that there is no conflict of interest in this study.

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Author Contribution :

Bharath Kumar. N : contributed in designing the study, execution of the project, statistical analysis, manuscript drafting.

Dr. V. Vishnu Priya : contributed in study design, guiding the research work, manuscript correction.

Dr. Kavitha. S : study design, statistical analysis, manuscript proof-reading and correction.

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