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Analysis Of Body Mass Index (Bmi) And Diet Patterns Among Undergraduate Students In An University Teaching Hospital At Chennai

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ABSTRACT:

Objective: Body mass index (BMI) is known as a measure of obesity that is imperfect. BMI is an index based on height and weight- which is used to measure the body fat. They used body mass index(BMI) to divide the students into 4 categories which are: underweight(BMI<19kg/m2), healthy weight (19kg/m2- 25kg/m2), our weight (26kg/m2- 30 kg/m2), and obese (>30 kg/m2).

Methods: The present study was conducted among 100 undergraduate students in a Private teaching hospital at Chennai. Weight measurement was done with the help of a digital weighing scale and height was measured with the help of a height measuring tape.

Results: The male and female participants involved in the study were 50.5%and 49.5% respectively. 60% were under the category of normal weight and 31% were overweight, 4% were obese, 52% were non- vegetarians and 48% were vegetarian.

Conclusion: The study was conducted among urban undergraduates. In future a similar study and counselling should be extended to the rural population as well.

KEYWORDS:

Innovative technique, Body mass index, college, health, dietary patterns, obesity, underweight, normal weight, novel method

INTRODUCTION:

Body mass index (BMI) is known as a measure of obesity that is imperfect. It was first introduced in the mid- 1800s, BMI is an index based on height and weight- which is used to measure body fat. As it is an indirect measure, some research results say that it is much correlated with direct measures such as the underwater weighing, dual energy x- ray absorptiometry BMI has serious flaws,

it does not take age, sex, bone structure, muscle weight into consideration. There are three main problems to be considered when using BMI (1). 1) errors from the fact that BMI is an indirect measure of obesity, 2) errors in the data self reported by the patient, 3) poor sensitivity and specificity of BMI (2) (3) .

Obesity is considered as a serious problem among teenegers(4)). Researchers have estimated that the prevalence of obesity in college in US- based people has increased from 12% in 1991 (5) to as high as 36% in 2004(6). The increase in the rates of obesity indicate an energy imbalance is created among the people taking in more than the expenditure. A healthy BMI ranges from 19kg/m2 to 25kg/m2, overweight being 25-29.9 kg/m2 and obese with >30kg/m2. The dietary choices chosen by the overweight and obese students are very much higher in fat and less nutrient-dense than those of the individuals with lower body weight, but no evidences links with high dietary fat intake with long term obesity. (7) (8).

Many university college students enjoy adjustments in their existing lifestyles and a weakening of nutritional intake at some stage in their university years. Numerous research suggested that university college students have irrelevant ingesting conduct together with skipping meals, taking excessive- junk food consumption with excessive fats and sodium however low calcium and iron.(9),(10), According to a WHO report, there may be a correlation among low Physical Activity on the one hand, and wrong diet, immoderate weight and weight problems at the other.(11) Our team has extensive knowledge and research experience that has translate into high quality publications (12),(13),(14),(15),(16),(17),(18),(19),(20),(21),(22),(23),(24),(25),(26),(27),(28),(29),(30),(31)
Therefore in this study, we examined the BMI, dietary type and lifestyle practises among college undergraduate students in a university teaching hospital at Chennai.

MATERIALS AND METHODS:

The above study was done among a sample size of 100 undergraduate students in a university teaching hospital at Chennai. The study setting was done in Saveetha Dental College, Department of Biochemistry. This study was done among 100 undergraduate students of Saveetha Dental College with safety measures. Students were asked to sign the consent forms and the study was done after giving proper guidelines and awareness. E-learning students were excluded from this study, as they cannot enter the university.

The students were called to the Department of Biochemistry for their weight and height measurement. Weight measurement was done with the help of a digital weighing scale and height was measured with the help of a height measuring tape.

Their age, diet type and their frequency of eating junk food per week were noted down and their BMI was calculated using a BMI calculator to avoid manual errors. Counselling was given according to their BMI range. Students with high BMI were asked to maintain a diet according to their BMI. Using goals set by Healthy People 2010, the calculated BMI was divided into 4 categories:
underweight(<19kg/m2); healthy weight(19-25kg/m2); overweight(25-30kg/m2); obese(>30kg/m2). (32).

RESULTS:

The results obtained for the above study among 100 undergraduate students in a university teaching hospital in Chennai were normal. Of the responses, 51% were males and 49% were females. The

calculated BMI for the undergraduate students were observed in a pie chart. 60% were under the category of healthy weight, 31% were under the category of overweight, 4% were obese and 5% were underweight. The frequency of eating junk food(days per week) was more among the students. 36% of the students have junk food at the frequency of 2 days per week, 28% of the students have junk food at the frequency of 3 days per week. The mean BMI among the students with the age group of <20 years is 24.48kg/m2 and the mean BMI among the age group of >=20 years is 22.74kg/m2.

Figure 1: Gender percentage

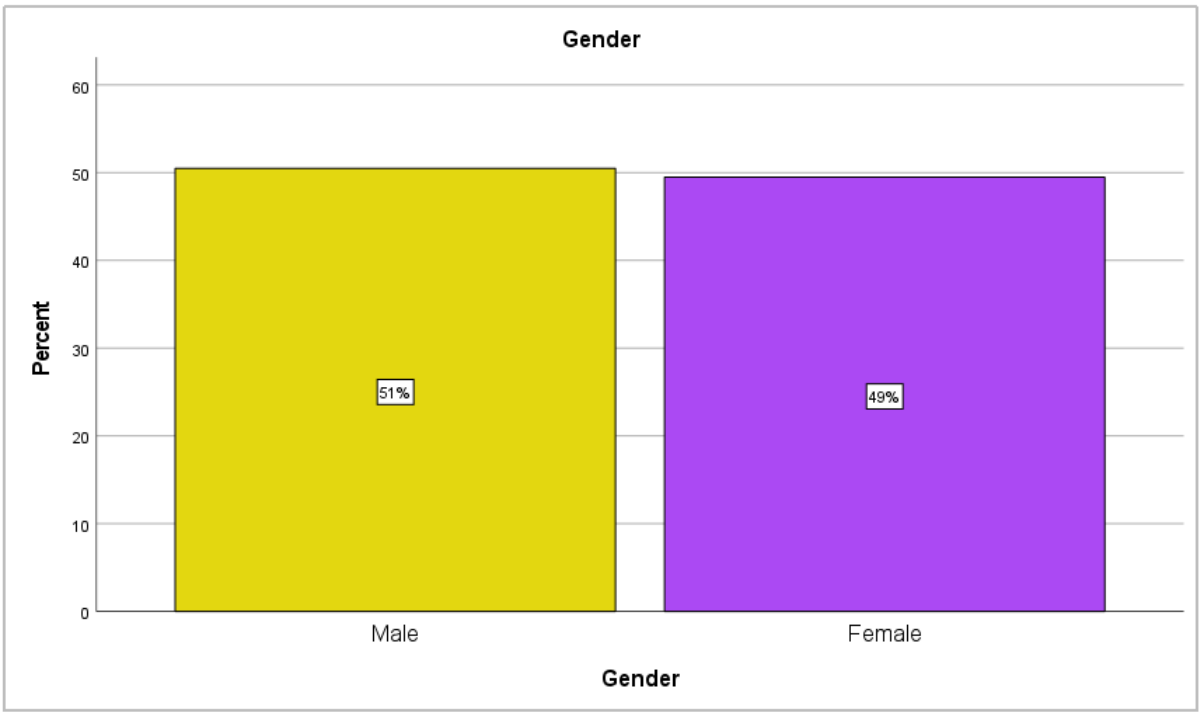

Figure 1 depicts the gender percentage of the participants. X-axis represents the gender and Y-axis represents the Percent of responses of the participants. Yellow represents “Male” and Purple represents “Female”. The observed data had 51% male participants and 49% female participants. The study involved nearly an equal number of male and female participants.

Figure 2: Diet type of the study population

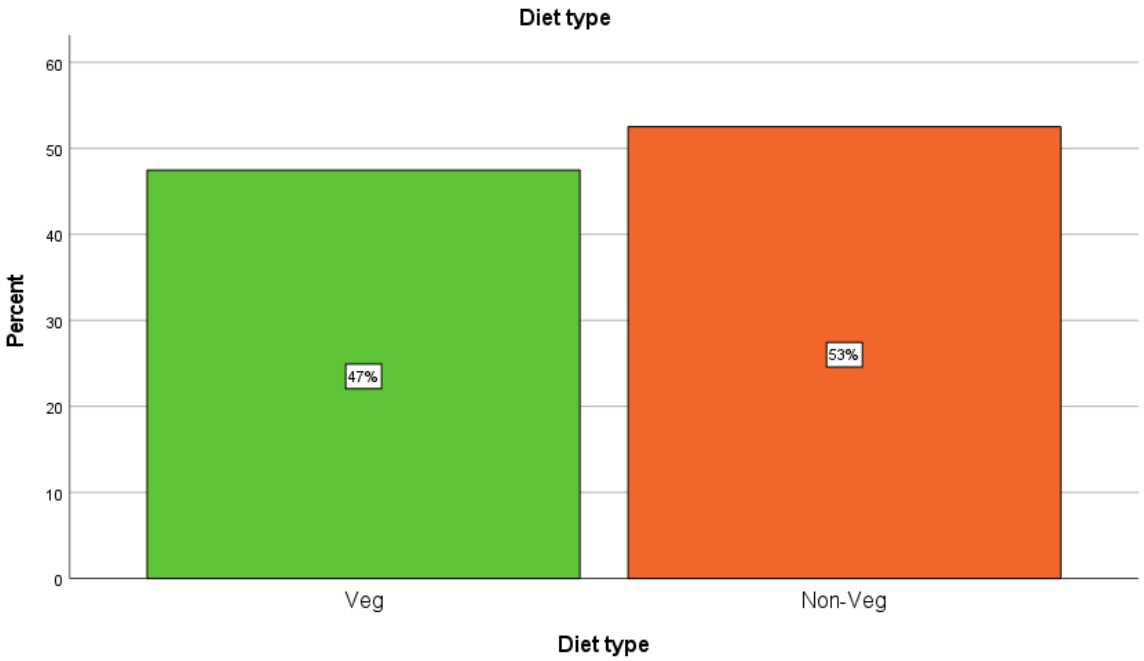

Figure 2 depicts the diet type of the participants. X-axis represents the diet type of the participants Y-axis represents the Percent responses of the participants. Green represents “Vegetarians”, and Orange represents “Non-vegetarians”. 47% of the population were vegetarians and 53% were non-vegetarian.

Figure 3: Frequency of eating junk food

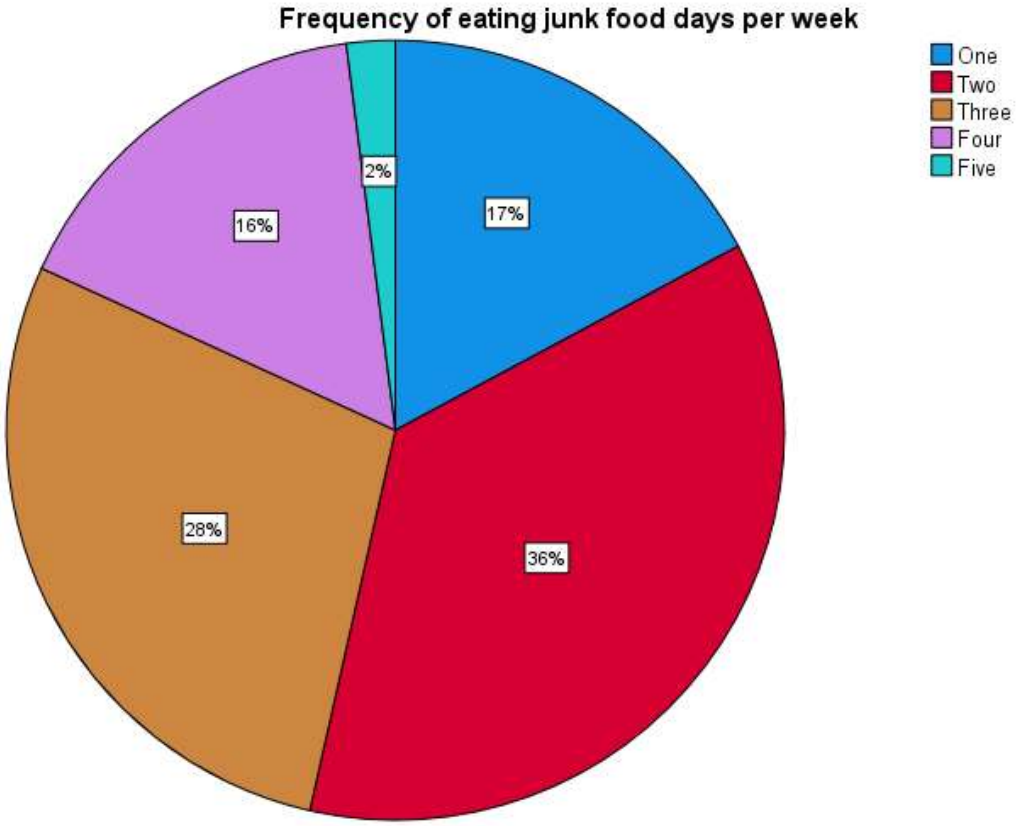

Figure 3 depicts the frequency of eating junk food by the participants. 36%(Red) of the participants prefer junk food 2 days per week, and 28%(Brown) take junk food with frequency of 3 days per week, 16%(Purple) shows a higher frequency of intake(4 days per week)

Figure 4: BMI of the population

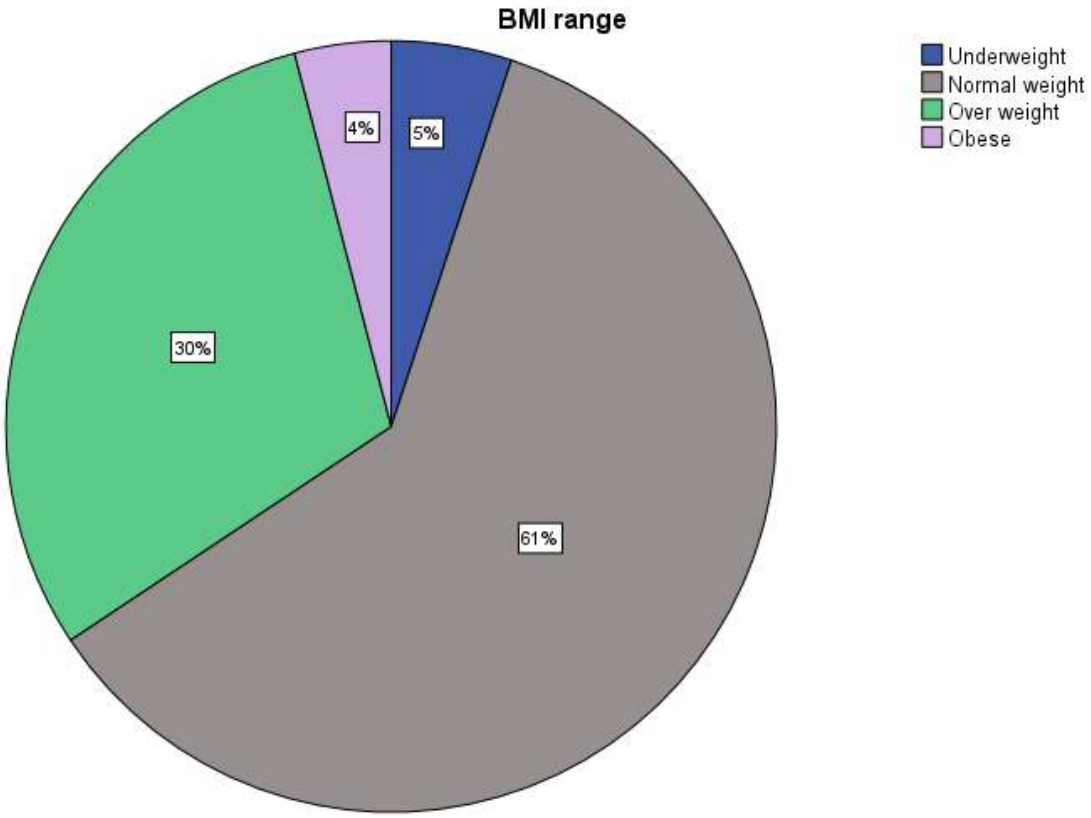

Figure 4 depicts the BMI of the population. 61% of the population (Grey) were under normal weight category, 30% of the population(Green) were under overweight category, 4% (Purple)were under the category of obese and 5%(Blue) were under-weight.

Figure 5: Comparison between Age group and BMI.

Figure 5 depicts the graph comparing age group and BMI. X- axis represents the age group and Y-axis represents the mean BMI. Brown represents the age group of "<20 years" and Pink represents the age group of ">=20 years". The mean BMI of the population of the age group of <20 years was 24.48 and the mean BMI of the population of the age group >= 20 years was 22.74.

Figure 6: Comparison between Sex amd BMI

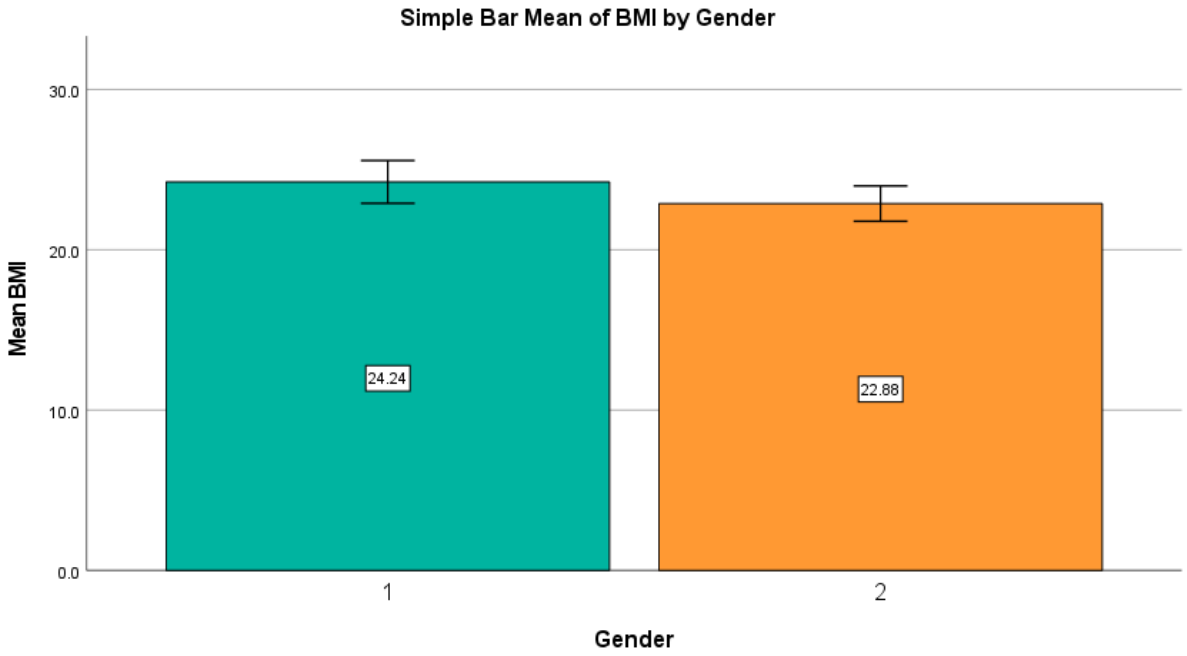

Figure 6 depicts the graph comparing sex and BMI. X-axis represents the sex of the participants and Y-axis represents the mean BMI. Aqua represents “Male” and Light Orange represents “Female”. The mean BMI of male participants was 24.24 and the mean BMI of the female participants was 22.88.

Figure 7: Comparison between Diet and BMI

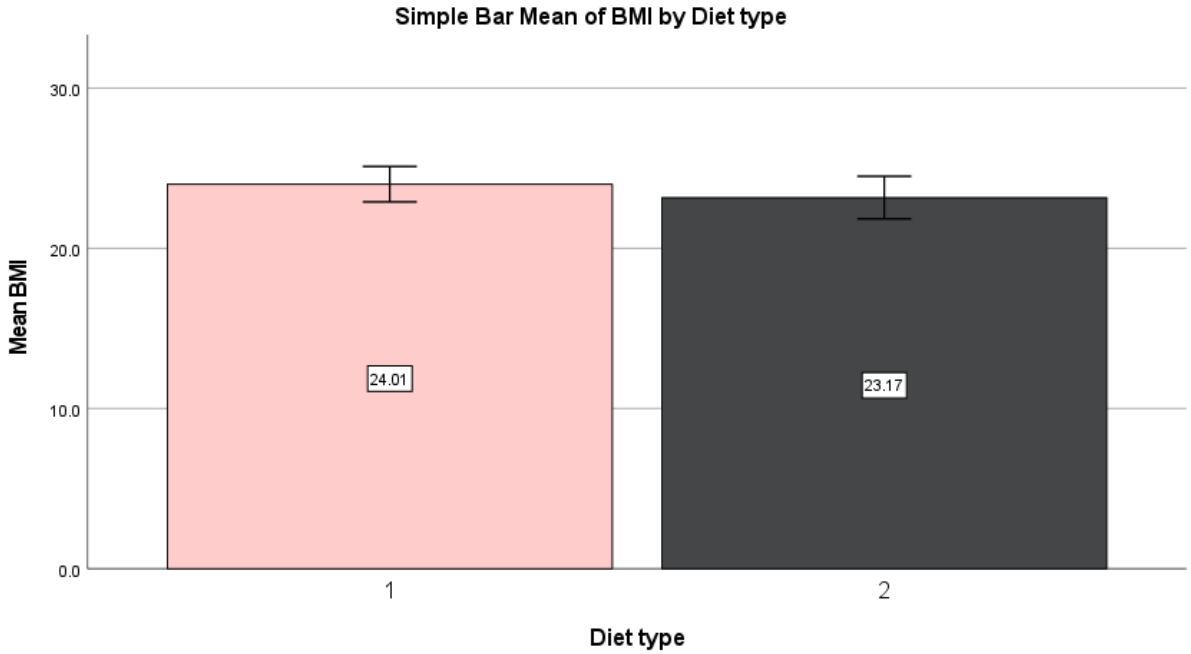

Figure 7 depicts the graph comparing diet type and BMI. X-axis represents the Diet type and Y-axis represents the mean BMI. Peach represents “Vegetarians” and Black represents “Non-vegetarians. Vegetarians had a mean BMI of 24.01 and Non-vegetarians had a mean BMI of 23.17.

DISCUSSION:

From the study it was evident that overall BMI among the students were 21-25 kg/m2 which indicates that most of them are fit and healthy, still their awareness towards the same needs to be investigated in the further study. The study involved an equal number of male and female participants to avoid bias on the basis of gender(Figure 1)Most of the earlier studies which were done on children and adolescents in India have reported that the prevalence of overweight as 12.6% and obesity as 3.4% (33). The findings of these studies show an overall diet variety of the children/students in an undergraduate college, their frequency of eating junk food in a week, and how the BMI is related to their age and gender.

From figure 2, 53% of the participants preferred Non-vegetarian diet and 47% preferred only Vegetarian diet which was surprising and it was a starting way for the awareness of BMI among the students.

Relation between BMI and age(age below 20 and above 20 was compared) was studied(Figure 5).It was observed that there was not a significant difference in BMI with respect to age. Students who were below 20 had an average BMI of 24.48 and above the age of 20 showed an average

BMI of 22.74. Though the difference is not significant, a small decrease in the BMI among the students above 20 years can be due to their study pressure , as they are on their verge to complete their course. Awareness was given to these sectors since after their routines get relaxed they should not get indulged in taking more junks.

As the study was conducted only among undergraduate students, there was no marked difference in BMI with related to the sex.(Figure 6) Both male participants and female participants had almost similar BMI.

The present study shows that most(61%)(Figure 4) of the undergraduate students fall under the category of normal weight and their BMI was also under normal category, but when asked about their eating practices regarding junk foods, there were about 16% of them who preferred to have junk at a frequency of 4 days per week(Figure 3) For the students who are under the category of overweight and obese, require awareness through education and motivation of the stakeholders. This will help in the prevention of rising non-communicable diseases such as diabetes and cardio-vascular disease in India.

After the study counselling regarding their diet , daily routines and psychological state was given to the students who fall under the category of overweight (30%) and obese (4%). They understood about their current health condition and the precautions to be taken for the improvement of the same. Simple lifestyle modifications were taught to them . They found the study very helpful as it has created an awareness regarding their health.

There is always a myth among girls that beauty is related to being underweight.Counselling was also given to students who belong to the category of underweight(5%).Awareness of the importance of taking a regular and proper diet was given to them. They were explained about the long term health issues related to underweight such as anaemia and infertility. Overall , the study has created an awareness on the relation between diet, daily routines and keeping fit among undergraduate students.

Limitations of the study was the small population size.Their fat content and muscle strength were not taken into account. The BMI may differ due to these factors and these factors may be taken into account in the further future studies.In the future study it is also recommended to conduct this study among the rural population.

CONCLUSION:

From the study , it was evident that the BMI of most of the undergraduate students fall in the category of normal weight. The study also involves counselling to the participants on their diet plan, daily routines and psychological well being. The study was conducted among urban undergraduates. In future a similar study and counselling should be extended to the rural population as well.

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CONFLICT OF INTEREST:

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

AUTHOR CONTRIBUTION:

S.Bhavesh - contributed in designing the study, execution of the project, statistical analysis, manuscript drafting.

V.Vishnu Priya - Study design, guiding the research work, manuscript correction.

Gayathri.R, Kavitha.S - Study design, statistical analysis, manuscript proofreading and correction.

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