

A Study on Assessment of Body Mass Index, Obesity Prevalence and Nutritional Education Intervention Through Salad Based Healthy Eating Promotion Among Students in Selected College at Coimbatore District

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Abstract—Obesity is an increasing public health concern among young adults, particularly college students exposed to irregular eating habits, sedentary lifestyles, and high consumption of energy-dense foods. Early adulthood is a critical stage for establishing long-term dietary behaviours. This study aimed to assess Body Mass Index (BMI), determine the prevalence of obesity among college students in a selected college in Coimbatore District, and promote healthy eating through a structured salad display demonstration.

A quantitative descriptive research design was adopted. Data were collected using a structured questionnaire to assess demographic details and dietary habits. Height and weight were measured to calculate BMI using the standard formula (kg/m^2) and classified according to WHO criteria. The prevalence of underweight, normal weight, overweight, and obesity was determined. A salad display demonstration was conducted to educate students on balanced nutrition, portion control, and the importance of fruits and vegetables.

Findings showed varied BMI categories, with a considerable proportion of students being overweight or obese. The intervention improved awareness and encouraged healthier dietary practices. The study concludes that regular BMI assessment combined with practical nutrition education strategies can effectively prevent obesity and promote healthy eating behaviours, reducing the future risk of non-communicable diseases among college students.

Index Terms—Body Mass Index (BMI), Obesity, Overweight, Prevalence, Healthy Eating, Salad Display

Demonstration, Nutrition Education, College Students, Anthropometric Assessment, Health Promotion.

I. INTRODUCTION

Overweight and obesity among college students have emerged as substantial public health concerns in recent years, driven by changing dietary patterns, lifestyle behaviours, and urbanisation¹. Recent Indian cross-sectional research among college students has shown that a notable percentage of students are classified as overweight or obese based on BMI assessments, with irregular eating patterns and high consumption of energy-dense foods cited as contributing factors². In a Tamil Nadu college study, a proportion of students exhibited deviations from normal BMI, highlighting the need for focused nutritional assessment in this demographic³.

Anthropometric studies conducted in central India among college populations reported that substantial percentages of students fall into overweight and obese BMI categories, reinforcing the observed trend of excess weight gain among young adults⁴. Findings from a 2023 cross-sectional survey in Central India documented that a significant fraction of participants were overweight, reflecting dietary and lifestyle influences on body weight⁵.

Evidence from broader university samples also indicates that approximately 30% of young adults globally are either overweight or obese, with dietary

choices, physical inactivity, and behavioural patterns influencing BMI outcomes⁶. These trends, identified in recent research, underscore the vulnerability of college populations to weight-related health risks and the importance of early screening and intervention.

Unhealthy dietary habits among students including frequent intake of fast foods, low fruit and vegetable consumption, and irregular meal frequency have been associated with higher BMI and increased risk of metabolic disorders⁷. Observational studies suggest that these behaviours, coupled with academic stress and sedentary lifestyles, contribute to weight gain and adverse health outcomes⁸.

Nutrition education interventions targeting university students have demonstrated effectiveness in improving dietary practices and fostering healthier eating behaviours⁹. Practical approaches such as food demonstrations and nutrition promotion activities have been shown to increase awareness and encourage the adoption of balanced diets rich in fruits and vegetables, which are essential for maintaining healthy body weight and reducing the risk of non-communicable diseases¹⁰.

The prevalence of elevated BMI among college students and the influence of dietary behaviours on long-term health, the present study was designed to assess BMI and determine the prevalence of overweight and obesity among 60 students in a selected college in Coimbatore District and to promote healthy eating through a salad display demonstration.

II. AIM AND OBJECTIVES

AIM:

To assess Body Mass Index (BMI) and determine the prevalence of overweight and obesity, and to promote healthy eating through a salad display demonstration among 60 college students in a selected college, Coimbatore District.

OBJECTIVES:

1. To assess the Body Mass Index (BMI) of college students using anthropometric measurements.
2. To determine the prevalence of underweight, normal weight, overweight, and obesity among the students.
3. To organize and implement a salad display demonstration to promote healthy eating practices.

4. To provide health education and counselling on healthy eating practices for students studying in the selected college.

III. REVIEW OF LITERATURE

Overweight and obesity among college students have become a growing public health concern globally and in India. Young adulthood is a critical period characterized by increased independence, lifestyle transitions, and behavioural experimentation, which significantly influence dietary and physical activity patterns. Several recent studies have documented a rising prevalence of overweight and obesity among university students, emphasizing the need for early screening and preventive interventions.

A cross-sectional study conducted among Indian college students (**Gupta *et al.*, 2020**) reported that a considerable proportion of students were categorized as overweight and obese based on BMI classification. The study identified lifestyle determinants such as frequent fast-food consumption, low intake of fruits and vegetables, reduced physical activity, and prolonged screen time as significant contributors to increased body weight. The authors concluded that obesity prevention strategies should be initiated during college years to reduce long-term health risks.¹¹

Similarly, Al-Qahtani (2022), in a study published in the *Journal of American College Health*, examined dietary habits and BMI among university students and found a strong association between unhealthy eating behaviours and elevated BMI. Students who skipped breakfast, consumed sugar-sweetened beverages regularly, and relied on processed snacks were more likely to fall into overweight and obese categories. The study emphasized that irregular meal patterns and poor diet quality significantly contribute to weight gain among young adults.¹²

Sogari *et al.*, (2020), in *Nutrients*, explored factors influencing eating behaviour among college students and reported that stress, academic workload, convenience, affordability, and peer influence affect food choices. Many students preferred energy-dense, nutrient-poor foods due to time constraints and easy availability. The study highlighted that dietary patterns formed during university years often persist into adulthood, increasing susceptibility to chronic diseases such as diabetes, hypertension, and cardiovascular disorders.¹³

Deliens *et al.*, (2021), in Public Health Nutrition, investigated determinants of eating behaviour in university settings and found that environmental factors such as campus food environment, vending machine availability, and marketing strategies significantly influence students' dietary intake. The authors suggested that institutional-level interventions, including health promotion programs and healthy food displays, can positively modify eating behaviour.¹⁴

Intervention-based studies further support the effectiveness of nutrition education in improving dietary practices. **Yahia *et al.*, (2023)**, in Frontiers in Nutrition, demonstrated that structured nutrition education programs significantly enhanced students' knowledge regarding balanced diets and increased their fruit and vegetable consumption. The study emphasized that participatory and practical approaches, including demonstrations and visual learning methods, are more effective in promoting behaviour change than conventional lecture-based education.¹⁵

Evidence from recent literature consistently indicates that overweight and obesity are prevalent among college students and are closely linked to unhealthy dietary habits and sedentary lifestyles. Furthermore, research supports the implementation of practical nutrition education strategies, such as food demonstrations and salad displays, as effective measures to enhance awareness and encourage healthier food choices. These findings justify the need for assessing BMI and implementing targeted health education interventions among college students.

IV. MATERIALS AND METHODOLOGY

Research Approach:

A quantitative research approach was adopted for the study.

Research Design:

A descriptive research design was used to assess BMI and prevalence of obesity among college students.

Setting of the Study:

The study was conducted in a selected college in Coimbatore District.

Population:

The population consisted of students studying in the selected college.

Sample Size:

The sample size comprised 60 college students.

Sampling Technique:

Convenience sampling technique was used to select the participants.

Inclusion Criteria:

- Students who were willing to participate in the study.
- Students who were present during the period of data collection.

Exclusion Criteria:

- Students with known chronic illnesses affecting body weight.

Variables of the Study:

- Independent Variable: Health education counselling and salad display demonstration.
- Dependent Variable: BMI status and knowledge regarding healthy eating.

Data Collection Tools:

1. Section A: Structured questionnaire to collect demographic data such as age, gender, type of diet, Frequency of Consumption of Processed Foods.
2. Section B: Anthropometric measurements:
 - Height measured using a stadiometer (in cms).
 - Weight measured using a calibrated weighing scale (in kgs).

BMI was calculated using the formula:

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

BMI classification was done according to standard WHO criteria.

Intervention:

After BMI assessment, a structured salad display demonstration was organized. The demonstration included:

- Display of various healthy salads prepared using vegetables, fruits, sprouts, and nuts.
- Explanation of nutritional value and health benefits of ingredients.
- Emphasis on balanced diet, portion control, and daily inclusion of fruits and vegetables.
- Health education counselling regarding prevention of overweight and obesity.

Method of Data Collection:

Prior permission was obtained from the college authority. Informed consent was taken from the students. Data were collected by measuring height and

weight and administering the questionnaire. Following assessment, the salad display demonstration and counselling session were conducted.

Data Analysis:

BMI categories were presented using tables and charts to determine the prevalence of overweight and obesity among the students.

V. RESULTS AND DISCUSSION

SECTION-A: DEMOGRAPHIC PROFILE

i) GENDER

A total of 60 college students participated in the study. Among them, 40 (66.7%) were girls and 20 (33.3%) were boys (Fig. 1).

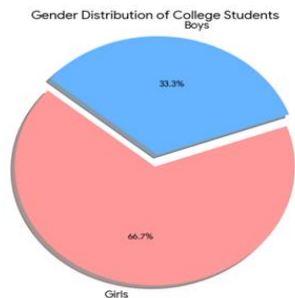


Fig. 1: Percentage distribution of Gender

ii) TYPE OF DIET:

The majority of the participants, 52 students (86.7%), followed a non-vegetarian diet, occupying the largest portion of the chart. In contrast, only 8 students (13.3%) followed a vegetarian diet, representing a much smaller segment (Fig. 2).

This indicates that non-vegetarian dietary practices are highly predominant among the study population.

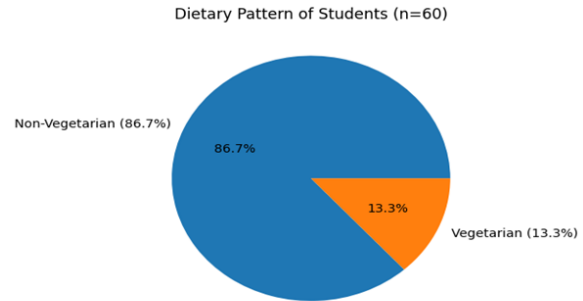


Fig. 2: Percentage distribution of type of Diet

iii) FREQUENCY OF CONSUMPTION OF PROCESSED FOODS:

The analysis of processed food consumption among the students revealed varied intake patterns. A total of 10 students (16.7%) consumed processed foods daily, while 12 students (20%) reported consumption 4–6 times per week. The highest proportion, 14 students (23.3%), consumed processed foods 2–3 times per week. Additionally, 9 students (15%) consumed processed foods once per week, 10 students (16.7%) consumed them occasionally, and only 5 students (8.3%) reported never consuming processed foods (Fig. 3).

Overall, more than one-third of the students (36.7%) consumed processed foods four or more times per week. This frequent intake of high-calorie, high-fat, and high-sugar foods may contribute to the observed 35% prevalence of overweight and obesity in the study population.

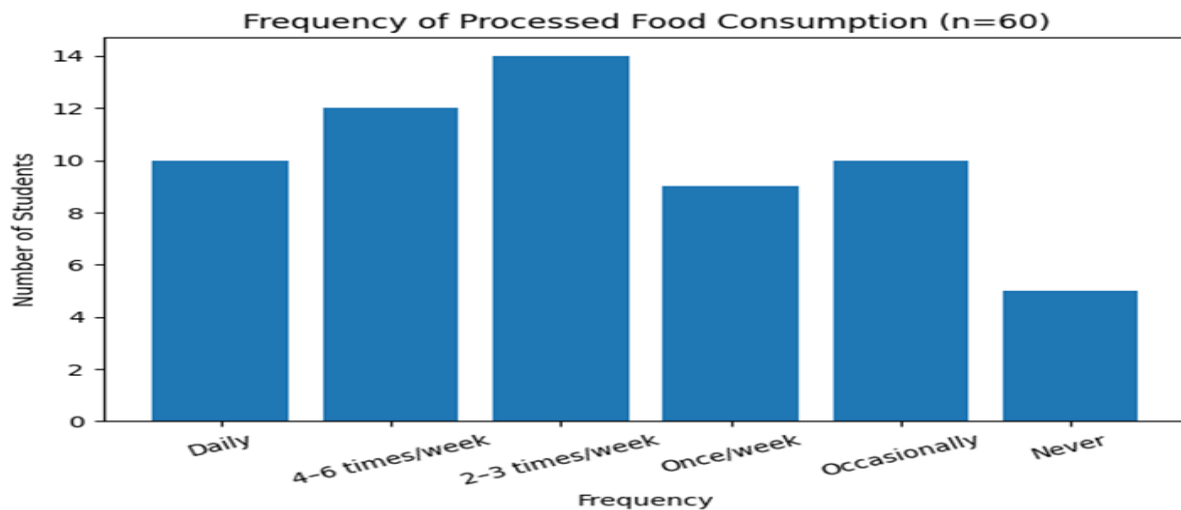


Fig. 3: Frequency of Processed food Consumption

SECTION – B: BMI DISTRIBUTION

The findings reveal that nearly half of the students (48.3%) had normal BMI. However, 21 students (35%) fell under overweight and obesity categories combined, indicating a considerable prevalence of excess body weight among college students. Additionally, 16.7% were underweight, reflecting the coexistence of undernutrition and overnutrition within the same population (Fig. 4).

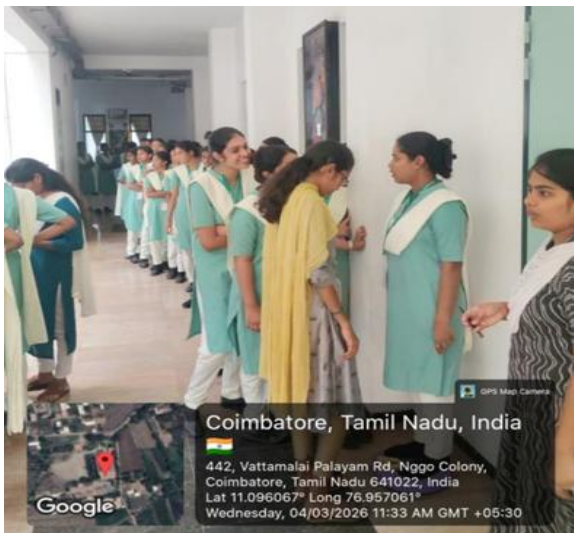
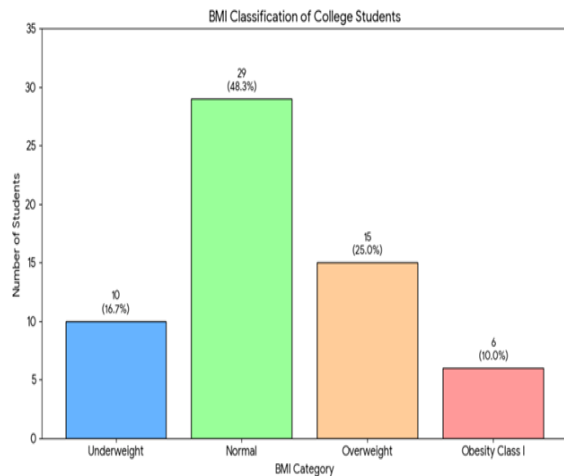


Fig. 4: Percentage Distribution of BMI among College Students

INTERVENTION

A structured salad display demonstration was conducted as a practical nutrition education strategy to promote healthy eating among the students. A variety of salads were prepared and displayed using locally

available ingredients such as green leafy vegetables, raw vegetables, fruits, sprouts, nuts, and seeds. Each salad was designed to highlight specific nutritional benefits, including high dietary fiber content, essential vitamins, minerals, and antioxidants. Emphasis was placed on incorporating a balance of macronutrients and micronutrients in daily meals.

During the demonstration, detailed explanations were provided regarding the nutritional composition of each ingredient, including the role of fiber in digestion, the importance of vitamins and minerals in maintaining immunity, and the benefits of antioxidants in preventing chronic diseases. Students were educated on portion control, calorie awareness, and the importance of including a variety of colors in meals to ensure dietary diversity.

The session also included guidance on simple, cost-effective, and time-saving methods of preparing healthy salads, making it practical for students to adopt these habits in their daily routine. Attention was given to hygienic food preparation practices and safe handling of raw foods. Alternatives to high-calorie dressings were suggested, such as the use of lemon juice, curd, and minimal oil-based dressings (Fig. 5). Individual and group counselling sessions were conducted to reinforce the importance of balanced nutrition. Students were educated about the harmful effects of frequent consumption of processed and fast foods, including their association with obesity and non-communicable diseases. Personalized suggestions were provided based on students' dietary patterns to encourage gradual modification of unhealthy eating habits.

Interactive discussions were encouraged to address misconceptions related to dieting and healthy eating. Students actively participated by sharing their usual food habits and challenges faced in maintaining a healthy diet, which helped in tailoring the counselling effectively. Educational pamphlets and simple dietary guidelines were also provided to reinforce learning.

The intervention aimed to create awareness regarding healthy food choices and motivate students to adopt sustainable dietary practices. The use of visual and participatory methods, such as the salad display, enhanced engagement and improved understanding compared to conventional lecture-based teaching. This approach facilitated better retention of knowledge and increased the likelihood of behavioural change toward healthier eating patterns.



Fig. 5: Nutritional Education Intervention Through Salad Based Healthy Eating Promotion Among Students

VI. CONCLUSION

The present study clearly establishes that overweight and obesity are emerging as significant health concerns among college students, reflecting a broader shift in lifestyle and dietary patterns during early adulthood. The findings revealed that 35% of the participants were either overweight or obese, while a notable proportion were underweight, indicating the coexistence of overnutrition and undernutrition within the same population. This dual burden highlights the complexity of nutritional issues among young adults and emphasizes the need for balanced and targeted interventions. The high frequency of processed food consumption, irregular eating habits, and preference for energy-dense diets observed among students were identified as key contributing factors influencing Body Mass Index (BMI).

The study further reinforces the importance of early screening and monitoring of BMI as a simple, reliable, and cost-effective method for identifying individuals at risk of developing weight-related health problems. Early adulthood is a critical stage where lifelong dietary behaviours are formed, and any imbalance during this period can predispose individuals to non-communicable diseases such as diabetes, hypertension, and cardiovascular disorders in later life. Therefore, timely identification through anthropometric assessment plays a crucial role in preventive healthcare.

A major strength of the study lies in the implementation of a structured salad display demonstration as a practical and participatory nutrition education strategy. Unlike conventional lecture-based approaches, the demonstration provided a visual and experiential learning platform, enabling students to better understand the nutritional value of foods,

importance of portion control, and benefits of incorporating fruits, vegetables, sprouts, and nuts into their daily diet. The intervention effectively improved awareness and motivated students to make healthier food choices. The use of locally available, affordable ingredients further enhanced the feasibility and sustainability of adopting such dietary practices in everyday life.

The interactive counselling sessions complemented the demonstration by addressing individual dietary patterns, correcting misconceptions, and encouraging gradual behavioural changes. This combined approach of education and engagement proved to be more impactful in influencing students' attitudes toward healthy eating. It also highlighted that knowledge alone is insufficient unless supported by practical exposure and motivation.

In conclusion, the study underscores the urgent need for integrated health promotion strategies within college settings. Regular BMI screening, combined with innovative and practical nutrition education interventions such as food demonstrations, can significantly contribute to the prevention and control of obesity among young adults. Institutional support in the form of awareness programs, healthy campus food environments, and continuous counselling can further strengthen these efforts. By promoting healthy eating behaviours during college years, it is possible to foster long-term lifestyle modifications, improve overall well-being, and reduce the future burden of non-communicable diseases in the population.

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