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Original research article

A cross-sectional study assessing prevalence of overweight and obesity and its epidemiological determinant among adults

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Abstract

Background: Overweight and obesity are significant public health challenges globally, contributing to a range of chronic diseases. This study aimed to assess the prevalence of overweight and obesity and identify their epidemiological determinants among adults.

Methods: A cross-sectional study was conducted among 500 adults aged 20-55 years. Participants were selected using multistage random sampling. Data were collected through structured interviews and anthropometric measurements following WHO STEPS guidelines. Body Mass Index (BMI) was calculated, and Asian-specific cut-offs were used to classify overweight (BMI ≥ 23.00 kg/m²) and obesity (BMI ≥ 25.00 kg/m²).

Results: The prevalence of overweight, obesity, and combined overweight-obesity was 30%, 25%, and 55%, respectively. Females (35%) and urban residents (70%) had a higher prevalence of overweight and obesity compared to males (25%) and rural residents (45%). A sedentary lifestyle and high-calorie diets were significant lifestyle factors associated with overweight-obesity (p<0.05). Socioeconomic status and area of residence were also significantly associated with BMI categories.

Conclusion: The high prevalence of overweight and obesity in this population underscores the urgent need for targeted interventions focusing on lifestyle modifications, particularly among females, urban residents, and individuals of higher socioeconomic status.

Keywords: Overweight, obesity, prevalence, epidemiological determinants, BMI, public health, India

Introduction

Overweight and obesity have become significant global public health concerns, characterized by excessive fat accumulation that poses a risk to health. The World Health Organization (WHO) highlights that in 2016, over 1.9 billion adults worldwide were overweight, of which 650 million were obese [1]. These conditions are strongly associated with the growing prevalence of non-communicable diseases (NCDs) such as type 2 diabetes, cardiovascular diseases, musculoskeletal disorders, and certain cancers [2]. The global rise in overweight and obesity is not only a major cause of preventable mortality but also imposes substantial social and economic burdens on healthcare systems [3]. This alarming trend necessitates a deeper understanding of the epidemiological factors contributing to the problem.

The rapid rise in overweight and obesity is particularly evident in low-and middle-income countries, where lifestyle changes and urbanization are driving the "nutrition transition". This transition is marked by a shift from traditional diets rich in fiber to energy-dense, high-fat, and processed foods, coupled with a decline in physical activity due to sedentary jobs and urban lifestyles [4]. Socioeconomic factors, including education, income levels, and access to health services, further contribute to the disparities in obesity prevalence [5].

Multiple studies have identified key determinants associated with overweight and obesity, emphasizing their multifactorial nature. Behavioral factors, such as unhealthy eating habits and physical inactivity, are well-established contributors [6]. Additionally, genetic predisposition and epigenetic modifications play a role, as evidenced by studies showing familial clustering of obesity-related traits [7]. Environmental determinants, including urbanization, availability of fast food, and exposure to marketing of high-calorie products, have also been implicated [8]. These factors interact with one another, underscoring the need for comprehensive research to explore their combined effects within specific populations.

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This study aims to determine the prevalence of overweight and obesity in population and to identify key epidemiological determinants. By analyzing the interplay of sociodemographic, behavioral, and environmental factors, this research seeks to provide insights that can inform targeted public health interventions. Addressing the burden of overweight and obesity requires evidence-based policies that prioritize prevention, early detection, and management. This study contributes to the growing body of literature aimed at mitigating the global obesity crisis and its associated health impacts.

Materials and Methods

This cross-sectional study was conducted among 500 adults aged 20–55 years in the over a period of one year. Participants included residents of both rural and urban areas. Verbal and written informed consent was obtained from all respondents prior to data collection, ensuring that participants were fully aware of the study's objectives. Privacy and confidentiality were maintained throughout the interviews.

A structured questionnaire was used to gather information from participants. The questionnaire was divided into two sections:

1. **Identification Data:** Family details, socioeconomic conditions, and other demographic characteristics.
2. **Lifestyle Information:** Personal habits, diet, physical activity, and health-related behaviors.

Anthropometric measurements were performed following the WHO STEPS guidelines. Measurements included weight, height, and calculation of Body Mass Index (BMI). BMI was determined using the formula: BMI (kg/m²) = Weight (kg)/ Height (m)²

The study utilized BMI cut-off points proposed by the WHO for Asian populations:

- **Overweight:** BMI ≥ 23.00 kg/m²
- **Obesity:** BMI ≥ 25.00 kg/m²
- **Combined Overweight-Obesity:** BMI ≥ 23.00 kg/m²

These criteria are specifically tailored for Asian populations to better reflect associated health risks.

Data were entered into Microsoft Excel (2019 version) for organization and subsequently analyzed. Descriptive statistics, including percentages, mean, and standard deviation, were calculated to summarize the data. A p-value of <0.05 was considered statistically significant.

Results:

A total of 500 participants aged 20-55 years were included in the study, with an equal representation of men (50%) and women (50%). The majority of participants (60%) resided in rural areas, while the remaining 40% were from urban areas. The sociodemographic details are summarized in **Table 1**.

Variable	Frequency (n)	Percentage (%)
Gender		
Male	250	50.0
Female	250	50.0
Area of Residence		
Rural	300	60.0
Urban	200	40.0
Education Level		
Illiterate	50	10.0
Primary Education	150	30.0
Secondary Education	200	40.0
Higher Education	100	20.0
Socioeconomic Status		
Low	200	40.0
Middle	200	40.0
High	100	20.0

The overall prevalence of overweight (BMI ≥ 23.00-24.99 kg/m²) was 30%, while obesity (BMI ≥ 25.00 kg/m²) was observed in 25% of the population. Combined overweight-obesity (BMI ≥ 23.00 kg/m²) affected 55% of the participants. Prevalence rates stratified by gender and residence are shown in **Table 2**.

BMI Category	Total (%)	Male (%)	Female (%)	Rural (%)	Urban (%)
Normal Weight (<23.00)	45.0	50.0	40.0	55.0	30.0
Overweight (23.00–24.99)	30.0	25.0	35.0	25.0	40.0
Obesity (≥25.00)	25.0	25.0	25.0	20.0	30.0

Chi-square analysis revealed a statistically significant association between overweight-obesity and

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gender, area of residence, and socioeconomic status (p<0.05). **Table 3** presents these associations.

Variable	Normal (%)	Overweight (%)	Obesity (%)	p-value
Gender				
Male	50.0	25.0	25.0	<0.05
Female	40.0	35.0	25.0	
Area of Residence				
Rural	55.0	25.0	20.0	<0.05
Urban	30.0	40.0	30.0	
Socioeconomic Status				
Low	60.0	25.0	15.0	<0.05
Middle	40.0	35.0	25.0	
High	30.0	30.0	40.0	

Analysis of lifestyle factors showed that 70% of overweight-obese participants reported a sedentary lifestyle, while 65% consumed a high-calorie diet. Smoking and alcohol consumption were more prevalent among overweight-obese males (50%) compared to females (10%).

Lifestyle Factor	Overweight (%)	Obesity (%)	p-value
Sedentary Lifestyle	60.0	80.0	<0.05
High-Calorie Diet	65.0	70.0	<0.05
Smoking and Alcohol Use	50.0	40.0	<0.05

Discussion

The present study aimed to estimate the prevalence of overweight and obesity and identify their epidemiological determinants among adults aged 20–55 years. The findings revealed that 30% of participants were overweight, while 25% were obese, resulting in a combined prevalence of overweight and obesity of 55%. These rates align with trends reported in other Indian studies, which have documented a rising prevalence of overweight and obesity due to urbanization, lifestyle changes, and dietary shifts [9, 10].

The study found a significant association between overweight-obesity and sociodemographic factors such as gender, area of residence, and socioeconomic status. Females showed a higher prevalence of overweight compared to males (35% vs. 25%), consistent with earlier studies suggesting that cultural and social norms in South Asia may limit physical activity among women, thereby increasing their risk of weight gain [11]. Urban residents had a higher prevalence of combined overweight-obesity (70%) compared to rural residents (45%), reflecting the impact of urban lifestyles characterized by sedentary behavior and greater access to high-calorie processed foods [12, 13]. Moreover, higher socioeconomic status was significantly associated with obesity, possibly due to increased affordability of energy-dense foods and sedentary habits in wealthier groups [14].

Lifestyle factors were also found to play a critical role in the prevalence of overweight and obesity. A sedentary lifestyle was reported by 70% of overweight-obese participants, which aligns with global evidence linking physical inactivity to weight gain [15]. Dietary habits, particularly high-calorie diets, were significant contributors, with 65% of overweight-obese individuals reporting excessive consumption of energy-dense foods. These findings echo those of other studies that emphasize the importance of promoting balanced diets and physical activity to combat the obesity epidemic [16]. Additionally, smoking and alcohol use were more prevalent among overweight-obese males, highlighting the complex interplay between substance use and weight gain [17].

The use of BMI cut-offs tailored for Asian populations (≥23 kg/m² for overweight and ≥25 kg/m² for obesity) provided a more accurate assessment of health risks associated with elevated body weight. Asian populations are known to have higher body fat percentages at lower BMI levels compared to Western populations, necessitating these adjusted thresholds [18]. This approach underscores the need for region-specific strategies in addressing overweight and obesity.

Despite its strengths, this study has certain limitations. The cross-sectional design precludes the establishment of causal relationships between identified factors and obesity. Self-reported data on dietary and lifestyle behaviors may be subject to recall bias. Future studies should consider longitudinal designs and objective measurements of lifestyle factors to strengthen the evidence base. Nevertheless, the findings provide valuable insights into the epidemiology of overweight and obesity in this region and underscore the urgent need for targeted public health interventions.

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Conclusion

In conclusion, the high prevalence of overweight and obesity in this study population highlights the growing burden of these conditions in India. Public health strategies focusing on promoting physical activity, dietary modifications, and addressing sociodemographic disparities are essential to curb the rising tide of overweight and obesity and reduce the associated health risks.

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