Section: Community Medicine

Original Research Article

OVERWEIGHT, OBESITY, AND THEIR DETERMINANTS IN AN URBAN ADULT POPULATION: A COMMUNITY-BASED CROSS-SECTIONAL STUDY

Apoorva E Patel[1], Hemanth Kumar S R[2]

[1]*Associate Professor, Department of Community Medicine, Pacific Institute of Medical Sciences, Umarda, Udaipur-313003, Rajasthan, India.*
[2]*Professor, Department of General Medicine, Pacific Institute of Medical Sciences, Umarda, Udaipur-313003, Rajasthan, India.*

Received *: 04/09/2025*
Received in revised form *: 22/10/2025*
Accepted *: 10/11/2025*

Corresponding Author:
Dr. Hemanth Kumar S R,
Professor, Department of General Medicine, Pacific Institute of Medical Sciences, Umarda, Udaipur-313003, Rajasthan, India..
Email: drhemanthsr@gmail.com

DOI: 10.70034/ijmedph.2025.4.335

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2025; 15 (4); 1875-1879

ABSTRACT

Background: The global surge in overweight and obesity represents a critical public health challenge, contributing significantly to the burden of non-communicable diseases. Understanding local prevalence and determinants is crucial for effective intervention. **Objective:** To determine the prevalence of overweight and obesity and to identify their associated epidemiological determinants among adults in an urban community.

Materials and Methods: A community-based cross-sectional study was conducted among 126 adults aged 18-65 years, selected via systematic random sampling. Data were collected using a pre-tested, semi-structured questionnaire covering socio-demographic, dietary, and physical activity profiles. Height and weight were measured to calculate Body Mass Index (BMI). Participants were classified as normal weight (BMI 18.5–24.9 kg/m²), overweight (25.0–29.9 kg/m²), or obese (≥30.0 kg/m²). Data analysis was performed using SPSS version 26, employing descriptive statistics and Chi-square tests, with a p-value <0.05 considered statistically significant.

Results: The mean age of participants was 38.4 ± 10.7 years. The overall prevalence of overweight and obesity was 34.1% (n=43) and 19.8% (n=25), respectively, culminating in a combined prevalence of 53.9%. A significant association was found between the prevalence of overweight/obesity and older age (p=0.008), sedentary occupation (p=0.02), high monthly income (p=0.03), consumption of junk food ≥3 times per week (p=0.01), and engagement in less than 150 minutes of moderate-intensity physical activity per week (p<0.001). No significant association was found with gender or family history.

Conclusion: The study reveals a high prevalence of overweight and obesity in the studied urban community, exceeding 50%. The key modifiable determinants identified were sedentary lifestyle and poor dietary habits. These findings underscore the urgent need for targeted community-based health promotion programs focusing on physical activity and nutritional education.

Keywords: Overweight, Obesity, Body Mass Index (BMI), Prevalence, Epidemiological Determinants, Cross-Sectional Study, Urban Health.

INTRODUCTION

Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health.[1] They are not merely aesthetic concerns but complex, multifactorial chronic diseases characterized by adiposity that impairs health and longevity. The Body Mass Index (BMI), a simple weight-for-height index, is the most commonly used proxy for classifying these conditions in populations, with a BMI of 25.0 to 29.9 kg/m² classified as overweight and a BMI of 30.0 kg/m² or above as obesity.[1]

The global surge in their prevalence represents one of the most daunting public health challenges of the 21st century, having reached pandemic proportions. Since 1975, worldwide obesity has nearly tripled, transforming from a minor issue of the affluent world to a pervasive global crisis.[2] In 2016, over 1.9 billion adults were overweight, and of these, over 650

million were obese, accounting for approximately 13% of the world's adult population.[1] This escalating trend spares no region, affecting high-, middle-, and low-income countries alike, and places an immense strain on healthcare systems and national economies through its associated morbidity, mortality, and productivity losses.

The health consequences of excess body weight are profound and far-reaching. It is a primary driver of the global burden of non-communicable diseases (NCDs), acting as a major risk factor for type 2 diabetes, cardiovascular diseases (including heart disease and stroke), certain cancers (such as endometrial, breast, ovarian, prostate, liver, gallbladder, kidney, and colon), and musculoskeletal disorders like osteoarthritis.[3] Furthermore, obesity is intricately linked to metabolic syndrome, sleep apnea, non-alcoholic fatty liver disease, and significant psychological impacts, including depression and reduced quality of life.[4] The COVID-19 pandemic further highlighted the vulnerability of individuals with obesity, who faced a significantly higher risk of severe illness and hospitalization.[5]

The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended. However, this simple equation belies a highly complex interplay of genetic, behavioral, environmental, and social factors. Globally, there has been a marked shift in dietary patterns towards increased intake of energy-dense foods that are high in fats, sugars, and salt but low in vitamins, minerals, and other micronutrients.[6] Concurrently, a dramatic rise in physical inactivity has occurred due to increasingly sedentary forms of work, changing modes of transportation, and rapid urbanization that often discourages active living.[7] This phenomenon, often termed the "nutrition transition," is particularly potent in low- and middle-income countries undergoing rapid economic development, where traditional, often healthier, diets are being replaced by ultra-processed foods and sedentary behaviors are becoming the norm.[8]

While global and national-level data provide a macro-level picture, they often mask significant micro-level variations. The prevalence and determinants of obesity are not uniform; they are shaped by unique local contexts, including cultural norms, socioeconomic status, built environments, and food landscapes. What drives obesity in one community may differ significantly from another. Therefore, localized epidemiological data is indispensable. Understanding the specific prevalence and the constellation of risk factors—be they age, income, occupation, dietary habits, or physical activity levels-within a defined population is a critical first step in the public health action cycle.

This study was, therefore, conceived to generate this essential local evidence. Its primary objectives are: 1) to determine the point prevalence of overweight and obesity among adults in a defined urban community, and 2) to identify the key epidemiological determinants associated with these conditions in this population. The findings from this research will provide a crucial evidence base for informing the design and implementation of targeted, context-specific health promotion and obesity prevention strategies at the community level, ultimately contributing to the broader effort to curb the global obesity pandemic.

MATERIALS AND METHODS

Research Design, setting and population

A community-based, analytical cross-sectional study design was employed. The study was conducted in the department of Community Medicine, Umarda, Udaipur. The target population for this study was all adults aged 18 to 65 years who were permanent residents (residing for at least six months).

Inclusion and Exclusion Criteria for Sample Selection

Inclusion Criteria

1. Adults aged 18-65 years.
2. Permanent residents of the study area (duration of residence ≥6 months).
3. Willing and able to provide informed consent.

Exclusion Criteria

1. Pregnant women (as pregnancy significantly alters BMI).
2. Individuals with physical deformities (e.g., severe kyphosis, amputations) that would impede accurate height or weight measurement.
3. Individuals who were critically ill or mentally unable to participate in the interview.

Sample Size Calculation

The sample size was calculated using the formula for estimating a single population proportion: $n = (Z^2 * P * Q) / d^2$

Where:

- **Z** = Z-score for 95% confidence level (1.96)
- **P** = Anticipated prevalence of overweight/obesity (estimated at 30% or 0.30 based on a previous regional study)
- **Q** = (1 - P) = 0.70
- **d** = Absolute precision (margin of error) set at 8% (0.08)

$n = (1.96^2 * 0.30 * 0.70) / 0.08^2 = (3.8416 * 0.21) / 0.0064 = 0.8067 / 0.0064 \approx 126$

Therefore, the minimum required sample size was **126**.

Procedure for Data Collection

Data collection was carried out over a period of three months (June - August 2025) by a trained team of two interviewers and one anthropometrist. The procedure was as follows:

1. **Questionnaire Administration:** After obtaining written informed consent, the pre-tested, semi-structured questionnaire was administered face-to-face in a private setting to collect data on socio-demographic, dietary, and lifestyle variables.

2. **Anthropometric Measurement:** Following the interview, height and weight were measured.
   - **Height:** Measured to the nearest 0.1 cm using a portable stadiometer (Seca 213), with the participant standing upright without shoes.
   - **Weight:** Measured to the nearest 0.1 kg using a calibrated digital weighing scale (Omron HN-289), with the participant in light clothing and without shoes.
   - All measurements were taken twice, and the average was recorded to ensure accuracy.

Data analysis

Collected data were checked for completeness at the end of each day. Data were entered into a Microsoft Excel spreadsheet using a pre-designed template. The cleaned data were imported into IBM SPSS Statistics for Windows, Version 26.0. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to summarize the data. The association between the outcome variable (overweight/obesity) and independent variables was analyzed using the Chi-square test. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Table 1: Prevalence of Overweight and Obesity among Study Participants (N=126)

BMI Category	BMI Range (kg/m²)	Frequency (n)	Percentage (%)
Normal Weight	18.5 – 24.9	58	46.0
Overweight	25.0 – 29.9	43	34.1
Obese	≥ 30.0	25	19.8
Total		**126**	**100.0**

The prevalence of various BMI categories among the participants is detailed in Table 1. Out of the 126 participants, 58 (46.0%) were found to be of normal weight. The prevalence of overweight was 34.1% (n=43), while obesity was identified in 25 individuals, accounting for 19.8% of the sample. The combined prevalence of overweight and obesity was therefore 53.9%, indicating that more than half of the study population had a BMI exceeding the normal range.

Table 2: Socio-demographic and Lifestyle Profile of the Study Participants (N=126)

Characteristic	Category	Frequency (n)	Percentage (%)
Age Group	18-35 years	57	45.2
	>35 years	69	54.8
Gender	Male	58	46.0
	Female	68	54.0
Occupation Type	Sedentary	60	47.6
	Non-Sedentary	66	52.4
Monthly Family Income (INR)	< ₹30,000	52	41.3
	≥ ₹30,000	74	58.7
Junk Food Intake	< 3 times per week	83	65.9
	≥ 3 times per week	43	34.1
Physical Activity Level	Sufficient (≥150 min/week)	58	46.0
	Insufficient	68	54.0
Family History of Obesity	Yes	37	29.4
	No	89	70.6

The socio-demographic and lifestyle profile of the study participants is presented in Table 2. The population was nearly evenly distributed between the 18-35 years age group (45.2%, n=57) and those above 35 years (54.8%, n=69). Regarding occupation, 60 participants (47.6%) were engaged in sedentary jobs. When classified by monthly family income, 74 participants (58.7%) belonged to households earning ₹30,000 or more. In terms of dietary habits, a considerable proportion, 43 individuals (34.1%), reported consuming junk food three or more times per week. Furthermore, 68 participants (54.0%) were classified as having insufficient physical activity according to WHO criteria. A family history of obesity was reported by 37 participants (29.4%).

Table 3: Association between Epidemiological Determinants and Overweight/Obesity (N=126)

Determinant	Category	Normal Weight n (%) (n=58)	Overweight/Obese n (%) (n=68)	p-value
Age Group	18-35 years	35 (60.3%)	22 (32.4%)	**0.001***
	>35 years	23 (39.7%)	46 (67.6%)	
Gender	Male	25 (43.1%)	33 (48.5%)	0.53
	Female	33 (56.9%)	35 (51.5%)	
Occupation Type	Sedentary	20 (34.5%)	40 (58.8%)	**0.006***
	Non-Sedentary	38 (65.5%)	28 (41.2%)	
Monthly Family Income (INR)	< ₹30,000	32 (55.2%)	20 (29.4%)	**0.003***
	≥ ₹30,000	26 (44.8%)	48 (70.6%)	
Junk Food Intake	< 3 times/week	45 (77.6%)	38 (55.9%)	**0.009***

	≥ 3 times/week	13 (22.4%)	30 (44.1%)	
Physical Activity Level	Sufficient	40 (69.0%)	18 (26.5%)	**<0.001***
	Insufficient	18 (31.0%)	50 (73.5%)	
Family History of Obesity	Yes	15 (25.9%)	22 (32.4%)	0.42
	No	43 (74.1%)	46 (67.6%)	

The associations between various determinants and the combined outcome of overweight/obesity are summarized in Table 3. A highly statistically significant association was observed with age (p=0.001), with individuals over 35 years of age constituting 67.6% of the overweight/obese group compared to only 39.7% of the normal-weight group. Occupation type was also a significant factor (p=0.006), with a notably higher proportion of sedentary workers in the overweight/obese category (58.8%) compared to the normal-weight category (34.5%).

Monthly family income showed a strong positive association with overweight/obesity (p=0.003). The majority of overweight/obese individuals (70.6%) had a monthly income of ₹30,000 or more, whereas this income bracket represented only 44.8% of the normal-weight population. Dietary habits played a significant role, as frequent junk food consumption (≥3 times/week) was reported by 44.1% of the overweight/obese group versus 22.4% of the normal-weight group (p=0.009). The most potent association was found with physical activity (p<0.001). A striking 73.5% of the overweight/obese participants had insufficient physical activity, in contrast to 31.0% of those with normal weight.

Conversely, no statistically significant associations were found between overweight/obesity and gender (p=0.53) or a family history of obesity (p=0.42).

DISCUSSION

This cross-sectional study provides a snapshot of the substantial burden of overweight and obesity in an urban Indian community, revealing a combined prevalence of 53.9%. This finding is not an isolated phenomenon but rather a reflection of the rapid epidemiological transition sweeping through urban India. The prevalence identified in our study is alarmingly high and aligns with the escalating national trend, underscoring a critical public health challenge that demands immediate and targeted intervention.

The socio-demographic and lifestyle determinants identified in our analysis paint a coherent picture of the drivers behind this epidemic. The strong association with older age is a well-documented finding, consistent with physiological changes such as a decline in metabolic rate, age-related sarcopenia (loss of muscle mass), and often, a reduction in physical activity levels with advancing age.[7] Our finding that individuals over 35 were significantly more likely to be overweight or obese highlights a critical window for mid-life lifestyle interventions.

The significant link between a higher monthly family income (≥₹30,000) and excess weight is particularly illustrative of the "nutrition transition" in an urban Indian context. This finding is supported by a study by Shetty (2020) on dietary transitions in India, which reported that higher disposable income in urban areas is strongly correlated with increased consumption of calorie-dense processed foods, animal fats, and sugary beverages, while the consumption of traditional whole grains and pulses declines.[8] This contrasts with historical patterns in Western countries, where obesity was initially a disease of the poor, and underscores the unique trajectory of the epidemic in developing economies like India, where economic growth initially empowers the purchase of energy-dense, non-nutritious foods.

Furthermore, our results demonstrate that this nutritional shift is compounded by a sedentary lifestyle. The powerful association between insufficient physical activity and overweight/obesity (p<0.001) is one of the most robust in public health literature. A sedentary occupation was independently associated with a higher risk, a finding echoed by a meta-analysis by Biswas et al. (2015), which concluded that high levels of sedentary behavior are independently associated with a significantly increased risk of weight gain, obesity, and cardiovascular disease.[9] The urban environment, with its reliance on motorized transport and a scarcity of safe, accessible spaces for recreation, creates an "obesogenic" environment that discourages physical activity.

Our finding that frequent junk food consumption (≥3 times per week) was significantly higher in the overweight/obese group further cements the role of diet. This aligns with a growing body of evidence on the role of ultra-processed foods. For instance, a study by Mendonça et al. (2016) found a direct dose-response relationship between the consumption of ultra-processed foods and the incidence of obesity, independent of physical activity levels.[10] The high palatability, hyper-processing, and aggressive marketing of these foods disrupt normal satiety signals, leading to overconsumption of calories.

Interestingly, our study did not find a significant association with gender or a self-reported family history of obesity. The lack of a gender association may reflect a converging of lifestyle risks between men and women in this specific urban setting, a trend that is being observed in other rapidly developing regions. The non-significant finding for family history could be due to the small sample size or the overpowering influence of the modifiable environmental and behavioral factors identified.

CONCLUSION

In conclusion, this study reveals that over half of the adult population in this urban community is affected by overweight or obesity, driven primarily by modifiable risk factors: sedentary behavior, unhealthy dietary patterns linked to higher income, and insufficient physical activity. The situation is urgent and requires a multi-pronged strategy.

We recommend:

1. **Integrated Public Health Campaigns:** Launching community-specific awareness programs that emphasize the dual importance of a traditional, balanced diet and regular physical activity, tailored to address the misconceptions associated with higher socioeconomic status.
2. **Environmental Modifications:** Advocating for urban planning policies that create "active environments," such as developing pedestrian-friendly zones, public parks, and cycling tracks.
3. **Workplace Wellness:** Encouraging the implementation of corporate wellness programs that break up prolonged sitting and promote physical activity among sedentary employees.
4. **Primary Care Strengthening:** Empowering primary health centers to routinely screen for BMI and provide brief, effective counseling on weight management as part of non-communicable disease prevention initiatives.

By addressing these key determinants through collaborative efforts between public health authorities, urban planners, and the community itself, the rising tide of obesity in urban India can be curbed.

REFERENCES

1. World Health Organization. Obesity and overweight [Internet]. 2021 [cited 2025 May 16]. Available from: https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight
2. NCD Risk Factor Collaboration (NCD-RisC). Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128·9 million children, adolescents, and adults. Lancet. 2017;390(10113):2627–42. DOI: 10.1016/S0140-6736(17)32129-3
3. Guh DP, Zhang W, Bansback N, Amarsi Z, Birmingham CL, Anis AH. The incidence of co-morbidities related to obesity and overweight: A systematic review and meta-analysis. BMC Public Health. 2009;9:88. DOI: 10.1186/1471-2458-9-88
4. Luppino FS, de Wit LM, Bouvy PF, Stijnen T, Cuijpers P, Penninx BWJH, et al. Overweight, obesity, and depression: a systematic review and meta-analysis of longitudinal studies. Arch Gen Psychiatry. 2010;67(3):220–9. DOI: 10.1001/archgenpsychiatry.2010.2
5. Popkin BM, Du S, Green WD, Beck MA, Algaith T, Herbst CH, et al. Individuals with obesity and COVID-19: A global perspective on the epidemiology and biological relationships. Obes Rev. 2020;21(11):e13128. DOI: 10.1111/obr.13128
6. Swinburn BA, Sacks G, Hall KD, McPherson K, Finegood DT, Moodie ML, et al. The global obesity pandemic: shaped by global drivers and local environments. Lancet. 2011;378(9793):804–14. DOI: 10.1016/S0140-6736(11)60813-1
7. Hallal PC, Andersen LB, Bull FC, Guthold R, Haskell W, Ekelund U, et al. Global physical activity levels: surveillance progress, pitfalls, and prospects. Lancet. 2012;380(9838):247–57. DOI: 10.1016/S0140-6736(12)60646-1
8. Shetty PS. Nutrition transition and its health outcomes. Indian J Pediatr. 2020;87(4):319-25. DOI: 10.1007/s12098-019-03107-y
9. Biswas A, Oh PI, Faulkner GE, Bajaj RR, Silver MA, Mitchell MS, et al. Sedentary time and its association with risk for disease incidence, mortality, and hospitalization in adults: a systematic review and meta-analysis. Ann Intern Med. 2015;162(2):123–32. DOI: 10.7326/M14-1651
10. Mendonça RD, Pimenta AM, Gea A, de la Fuente-Arrillaga C, Martinez-Gonzalez MA, Lopes ACS, et al. Ultraprocessed food consumption and risk of overweight and obesity: the University of Navarra Follow-Up (SUN) cohort study. Am J Clin Nutr. 2016;104(5):1433-40. DOI: 10.3945/ajcn.116.135004.