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Obesity and modern lifestyles: Prevalence and lifestyle correlates among urban adults in Ahmedabad City

¹Dr. Jeni Lawani and ²Dr. MK Chaudhary

¹Assistant Professor, Centre for applied Sciences and Technology, Ganpat University, Mehsana, Gujarat, India

²Assistant Professor, College of Basic Science and humanities, SDAU, Gujarat, India

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Corresponding Author: Dr. Jeni Lawani

Abstract

Obesity is a growing public health concern, especially in urban areas undergoing rapid lifestyle transitions. This study investigates the prevalence of obesity and its association with modern lifestyle factors among adults in Ahmedabad City, Gujarat. A total of 1200 respondents aged 20-55 years were selected using multi-stage random sampling. Anthropometric data, dietary patterns, and physical activity levels were assessed through structured questionnaires and analysed using descriptive and inferential statistics. The results revealed that 40.3% of respondents were pre-obese, and 12.8% were classified as obese (Grade 1-3). Socioeconomic factors, sedentary lifestyles, and increased consumption of calorie-dense foods were strongly associated with higher BMI levels. Additionally, 47.4% of respondents reported sedentary activity patterns, while 70% utilized online food delivery services. Notably, traditional dietary habits were observed during main meals, but snacking patterns often included fast food and processed items. The findings underscore the urgent need for targeted public health interventions to address obesity by promoting balanced diets, physical activity, and awareness of healthy lifestyle practices. This study provides valuable insights for policymakers and health professionals in designing effective obesity prevention strategies tailored to urban populations.

Keywords: Obesity prevalence, urban lifestyle, dietary patterns, physical activity, Ahmedabad, socioeconomic factors

Introduction

Obesity, defined as an excessive accumulation of body fat that poses a risk to health, has become a global concern affecting both developed and developing nations. It is primarily the result of an energy imbalance between calorie consumption and expenditure, exacerbated by changes in diet, physical activity, and urban lifestyles (Janssen *et al.*, 2004) ^[1]. The World Health Organization (WHO, 2021) categorizes obesity as a significant contributor to non-communicable diseases such as cardiovascular conditions, diabetes, and certain cancers, with urban areas being particularly vulnerable.

Globally, obesity prevalence has nearly tripled since 1975, with over 650 million adults classified as obese in 2016. In India, urbanization and the adoption of sedentary lifestyles have further accelerated this trend. Data from the National Family Health Survey (NFHS-5, 2019-2021) reveals that 33.2% of urban women and 29.8% of urban men are overweight or obese. Ahmedabad, a rapidly urbanizing city in Gujarat, has emerged as a focal point of this crisis. Surveys indicate that 16% of women and 12% of men in Ahmedabad are obese, surpassing national averages.

The dietary patterns in urban Ahmedabad reflect a shift from traditional foods to energy-dense, nutrient-poor options, often influenced by fast food and online food delivery systems. Additionally, sedentary work environments and limited physical activity contribute to the

alarming rates of obesity. Socioeconomic factors, including education, income, and occupation, further shape these trends, making obesity not just a medical condition but a social phenomenon.

This study aims to explore the prevalence of obesity in Ahmedabad's adult population, focusing on its relationship with modern lifestyle factors such as dietary habits, physical activity, and socioeconomic conditions. By identifying key lifestyle correlates, the research seeks to inform interventions tailored to urban populations grappling with obesity's health and social ramifications.

Materials and Methods

Selection of location

The study's title explicitly mentions that the study was conducted in Ahmedabad city. In the Indian state of Gujarat, Ahmedabad is the most populous city. Under the Government of India's Flagship Smart Cities Mission, Ahmedabad has been chosen as one of the hundred Indian cities to be built as a smart city. Ahmedabad was considered since it is one of Gujarat's fastest expanding cities, and as a result, significant changes in the city's population's life style have happened.

Research Design

Type: Ex-post-facto design.

This design is appropriate for assessing the prevalence of

obesity and its relationship with lifestyle factors since the independent variables, such as socio-economic status, dietary habits, and physical activity, cannot be controlled or manipulated.

Respondent Selection Criteria

Population: Adults aged 20-55 years residing in Ahmedabad City.

Inclusion Criteria

- Adults willing to participate in the study.
- Citizens residing in Ahmedabad for more than one year.

Exclusion Criteria

- Pregnant and lactating women.
- Individuals with physical deformities or acute illnesses.
- Individuals undergoing active weight loss programs.

Sampling Method

Sampling Technique: Multi-stage random sampling.

The city will be divided into six administrative zones (North, East, South, West, New-West, Central). A total of 1,200 respondents will be selected randomly, with proportional representation from each zone. This approach ensures comprehensive geographic coverage.

Data Collection

Tools

A structured questionnaire (administered via both physical forms and online forms). Anthropometric measurements (weight, height, BMI, waist circumference, hip circumference, waist-to-hip ratio).

Variables Assessed

Independent Variables

- **Demographics:** Age, gender, education, occupation, income, and socio-economic status.
- **Lifestyle factors:** Dietary habits, physical activity, use

of online food delivery platforms, and exercise frequency.

Dependent Variable: Body Mass Index (BMI).

Process

The questionnaire will be pre-tested on 20 respondents to ensure reliability and validity. Data will be collected both physically and digitally to maximize participation.

Statistical Analysis

Software: Statistical Package for the Social Sciences (SPSS), Version 20.

Techniques

Descriptive Statistics

Frequencies, percentages, and means to summarize demographic and lifestyle data.

Inferential Statistics

- **Chi-Square Test:** To assess the relationship between categorical variables (e.g., socio-economic status and BMI).
- **Regression Analysis:** To identify predictors of obesity.
- **t-Tests/ANOVA:** To compare mean differences in BMI across demographic and lifestyle variables.

Results and Discussion

BMI Distribution

A large proportion of the population is either pre-obese (40.3%) or has a normal BMI (41.5%). While 10.8% are categorized as obese in Class I, the prevalence decreases significantly in higher classes (1.6% in Class II and 0.4% in Class III). There is a clustering of BMI in the pre-obese range, indicating a shift towards higher BMI values in urban adults. The sharp decline in higher obesity classes suggests an intermediate stage where lifestyle interventions could prevent progression.

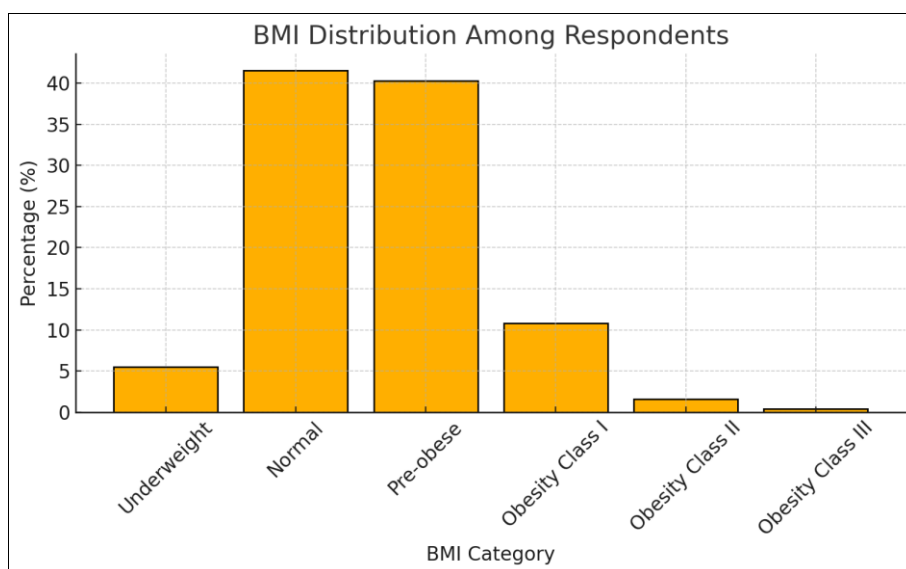


Fig 1: BMI Distribution Among Respondents

BMI Distribution Among Respondents: Illustrates the prevalence of different BMI categories within the study

population.

Physical Activity Patterns

Only 4.1% of respondents engage in heavy physical activity. Nearly half (48.5%) report moderate activity, and 47.4% are sedentary. A sedentary lifestyle is prominent, nearly matching moderate activity levels. This pattern reflects urban lifestyle constraints, including desk jobs, reliance on vehicles, and limited engagement in physically demanding activities. The low percentage of heavy physical activity indicates a need for targeted interventions to promote vigorous exercise habits.

Table 1: Physical Activity Pattern of Adults in Ahmedabad City

Physical Activity Pattern	Frequency (n)	Percentage (%)
Heavy	49	4.1
Moderate	582	48.5
Sedentary	569	47.4

Barriers to Exercise

The most significant barrier is an unsuitable environment (33.6%), followed by busy schedules (13.9%) and laziness (13.1%). Health problems and lack of interest contribute less significantly but still represent notable factors (9.7% and 6.7%, respectively). Environmental and scheduling issues dominate as barriers to exercise, highlighting the impact of urban infrastructure and lifestyle on health behavior. These trends suggest that solutions like community exercise programs, workplace fitness initiatives, and accessible recreational spaces are needed.

Table 2: Barriers to Exercise

Barrier	Frequency	Percentage (%)
Unsuitable Environment	290	33.6
Busy Schedule	120	13.9
Laziness	113	13.1
Health Problems	84	9.7
Lack of Interest	120	13.9
Not Required	134	15.5

Dietary Patterns

Vegetarianism is predominant (75.4%), followed by non-vegetarian (15.3%) and eggetarian (7.6%) diets. Only 1.8% of respondents follow a vegan diet. Food consumption trends include a preference for traditional meals but an increasing reliance on food delivery services, with 70% of respondents using such platforms. While the vegetarian diet remains dominant due to cultural factors, the rising use of food delivery apps reflects a shift toward convenience-driven eating habits. This reliance on outside food could lead to higher calorie intake and lower nutritional quality, contributing to obesity.

Table 3: Barriers to Exercise

Dietary Pattern	Percentage (%)
Vegetarian	75.4
Non-Vegetarian	15.3
Eggetarian	7.6
Vegan	1.8
Reliance on Food Delivery Apps	70.0

Demographic Correlations

Younger adults (20-35 years) represent the majority (70.5%), indicating a predominantly young urban

population in the study. Obesity prevalence correlates significantly with gender, education, income, and socioeconomic status (SES). Higher SES and education levels correlate with greater obesity prevalence, suggesting an "urban paradox" where economic progress contributes to sedentary lifestyles and unhealthy dietary habits.

Table 4: Personal and Socio-Economic Characteristics of Adults of Ahmedabad City

Category	Subcategory	Frequency (n)	Percentage (%)
Age (Years)	20-35	846	70.5
	36-55	354	29.5
Socio-Economic Status	Upper	82	6.8
	Upper Middle	512	42.7
	Lower Middle	484	40.3
	Upper Lower	121	10.1
	Lower	1	0.1
Education	Graduate	711	59.3
	High School and Below	150	12.7
	Diploma/Professional	339	28.2
Income (₹)	≥ 61,663	267	22.2
	30,831-61,662	507	42.2
	18,497-30,830	343	28.6
	≤ 18,496	83	6.9

Lifestyle Patterns

Sedentary activities like watching TV or using phones dominate leisure time. Stress and screen time are major contributors to poor sleep quality. The combination of sedentary leisure activities, stress, and inadequate sleep forms a lifestyle triad exacerbating obesity risks. Urban populations increasingly adopt passive recreation, underlining the need for active lifestyle promotion.

Table 5: Lifestyle Patterns Among Respondents

Lifestyle Pattern	Category	Percentage (%)
Physical Activity	Heavy	4.1
	Moderate	48.5
	Sedentary	47.4
Exercise Habit	Regular Exercise	28.3
	No Habit of Exercise	71.8
Barriers to Exercise	Unsuitable Environment	33.6
	Busy Schedule	13.9
	Laziness	13.1
	Health Problems	9.7
	Lack of Interest	6.7
	Not Required	15.5
Sleep Patterns (Weekdays)	Adequate Sleep (5-8 hrs)	88.3
	Insufficient Sleep (<5 hrs)	3.3
	Oversleeping (>8 hrs)	8.3
Reasons for Insufficient Sleep	Watching TV/Phones	31.7
	Stress	25.0
	Workload	26.7
	Household Work	13.3
	Sleep Disorders	3.3

The study analyzed the association of various independent variables with BMI among adults in Ahmedabad city and revealed several significant findings. Socio-economic status (SES) emerged as a crucial factor, with higher SES groups showing a strong association with increased overweight and obesity prevalence. This trend reflects dietary and lifestyle shifts typically seen with economic development. Similarly, variables such as education, occupation, and income were

highly significant in influencing BMI. Individuals with higher education levels, particularly graduates and professionals, exhibited higher rates of obesity, often attributed to sedentary lifestyles. Physical activity intensity was another significant variable, with moderate activity being the most common among respondents. However, higher activity levels were correlated with lower obesity prevalence. Family structure also played a role, as individuals from nuclear families showed a higher prevalence of obesity compared to those from joint families.

Dietary patterns, specifically irregular meal patterns and increased consumption of processed foods, were strongly associated with higher obesity levels. Finally, the lack of regular exercise emerged as a critical factor contributing to obesity, underscoring the importance of active lifestyles in managing weight effectively. These findings highlight the multifactorial nature of obesity and the importance of addressing both lifestyle and socio-economic factors in public health interventions.

Table 6: Association Between Independent Variables and BMI

Sr. No.	Name of Independent Variables	Chi-Square (χ^2)	p-value	Significance
1	Socio-Economic Status	1639.75	< 0.01	Highly Significant
2	Age	509.18	> 0.05	Not Significant
3	Gender	793.02	< 0.01	Highly Significant
4	Caste	1553.36	< 0.05	Significant
5	Education	2595.63	< 0.01	Highly Significant
6	Occupation	4691.88	< 0.01	Highly Significant
7	Income	2856.16	< 0.01	Highly Significant
8	Size of Family	1169.24	< 0.01	Highly Significant
9	Type of Family	562.20	< 0.01	Highly Significant
10	Physical Activity Intensity	1199.45	< 0.01	Highly Significant

Conclusion

This study highlights the significant prevalence of obesity among urban adults in Ahmedabad City, emphasizing the multifactorial nature of this public health challenge. The findings underscore the strong association between modern lifestyle factors-such as sedentary behavior, reliance on online food delivery services, and irregular dietary patterns-and elevated BMI levels. Notably, socio-economic status, education, and occupation were found to be highly significant predictors of obesity, reflecting the urban paradox where economic advancement often leads to unhealthy lifestyle behaviors. The predominance of sedentary activity, minimal engagement in heavy physical activity, and barriers like unsuitable environments and busy schedules further exacerbate the issue. Additionally, the cultural inclination toward vegetarian diets is being overshadowed by the growing consumption of calorie-dense, processed foods facilitated by convenience-driven eating habits. Addressing obesity in Ahmedabad's urban population requires targeted interventions, including public health campaigns promoting balanced diets, active lifestyles, and awareness of the risks associated with sedentary behavior and processed food consumption. Strategies such as community exercise programs, improved urban infrastructure to support physical activity, and workplace wellness initiatives can play a pivotal role. Furthermore, educating individuals about mindful eating and the importance of regular physical activity is critical. This research provides valuable insights for policymakers and healthcare professionals to design and implement effective obesity prevention and management strategies tailored to the urban context. By addressing both lifestyle and socio-economic determinants, these initiatives can significantly mitigate the rising obesity trend and its associated health risks, fostering a healthier urban population in Ahmedabad.

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