Comparative Analysis of Obesity Prevalence and Associated Factors among Urban and Rural Adult Populations: A Cross-Sectional Study

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Abstract:

Objective: The objective of this study was to compare the prevalence of obesity and its associated factors among adults residing in urban and rural areas.

Methods: A cross-sectional study was conducted on a sample of 500 adult participants (250 from urban practise area of DMCH and 250 from rural field practise area of RHTC, Kalyanpur). Demographic information, lifestyle factors, and health-related variables were collected using standardized questionnaires. Body mass index (BMI) was calculated using height and weight measurements. Prevalence rates of obesity were determined based on BMI categories. The data were analyzed using appropriate statistical tests, including chi-square tests and logistic regression analysis.

Results: The prevalence of obesity was found to be significantly higher in the urban population (47.2%) compared to the rural population (32.8%) ($p < 0.05$). Among the urban participants, 56.4% were classified as overweight compared to 43.6% in the rural group. The mean BMI was significantly higher in urban adults (28.5 ± 4.2) compared to rural adults (25.6 ± 3.9) ($p < 0.05$). Logistic regression analysis revealed that residing in an urban area was significantly associated with a higher risk of obesity (OR: 1.79, 95% CI: 1.24-2.58, $p < 0.05$), even after adjusting for age, sex, education level, income, physical activity, and dietary habits.

Conclusion: This study demonstrates a higher prevalence of obesity among adults living in urban areas compared to those residing in rural areas. Residing in an urban area was identified as a significant risk factor for obesity. These findings highlight the need for targeted interventions and policies addressing urban populations to combat the rising obesity epidemic and improve public health outcomes. Further research is warranted to explore the specific factors contributing to the urban-rural disparity in obesity prevalence.

Introduction

Obesity is a global public health concern that has reached epidemic proportions, with significant implications for individual health and healthcare systems [1,2]. It is associated with an increased risk of various chronic diseases, including cardiovascular disease, type 2 diabetes, certain cancers, and musculoskeletal disorders [3,4]. The prevalence of obesity has been steadily rising over the past few decades, posing a significant challenge to public health worldwide [5].

While the causes of obesity are multifactorial, numerous studies have demonstrated that both genetic and environmental factors play crucial roles in its development [6,7]. Among the environmental factors, urbanization has been identified as a key determinant influencing lifestyle choices and behaviors, ultimately contributing to the development of obesity [8,9]. Urban areas are characterized by distinct socioeconomic, cultural, and environmental factors that may influence dietary patterns, physical activity levels, and access to healthcare resources [10,11].

Several studies have reported a higher prevalence of obesity in urban populations compared to their rural counterparts [12,13]. These differences may arise due to various factors such as the availability of high-calorie processed foods, sedentary lifestyles, increased reliance on private transportation, and reduced opportunities for physical activity in urban environments [14,15]. However, the specific contributing factors and the magnitude of the urban-rural disparity in obesity prevalence may vary across different regions and populations. Understanding the differences in

obesity prevalence and its associated factors between urban and rural areas is crucial for developing targeted interventions and policies to address the obesity epidemic effectively. By identifying the unique challenges faced by urban populations, policymakers and healthcare professionals can implement strategies that promote healthy eating, physical activity, and overall well-being.

To date, limited research has been conducted on the comparison of obesity prevalence and associated factors specifically between urban and rural areas. Therefore, the aim of this study is to assess the prevalence of obesity and explore the associated factors among adults residing in urban and rural areas. By examining these differences, this study will contribute to the existing body of literature and provide valuable insights into the urban-rural disparities in obesity prevalence and its determinants.

Materials and Methods:

Study Design:

This study employed a cross-sectional design to compare the prevalence of obesity and its associated factors among adults residing in urban and rural areas.

Participants:

A total of 500 adult participants were recruited for this study, with 250 from urban practise area of DMCH and 250 from rural field practise area of RHTC, Kalyanpur. The participants were selected through random sampling methods from various neighborhoods in both urban and rural settings. Inclusion criteria for the study included being aged 18 years or above and providing informed consent to participate. Individuals with severe physical or mental health conditions that could affect their ability to respond to the study questionnaire were excluded.

Data Collection:

Data collection was conducted using standardized questionnaires and anthropometric measurements. Trained research assistants visited the selected urban and rural areas to administer the questionnaires and perform measurements.

Questionnaires:

The questionnaires consisted of several sections to collect information on demographic characteristics, lifestyle factors, and health-related variables. Demographic characteristics included age, sex, education level, and income level. Lifestyle factors

assessed included physical activity levels and dietary habits. Health-related variables encompassed self-reported medical history and family history of obesity or related conditions.

Anthropometric Measurements:

Height and weight measurements were obtained from each participant using calibrated instruments. Height was measured to the nearest 0.1 cm using a stadiometer, and weight was measured to the nearest 0.1 kg using a digital weighing scale. These measurements were performed with participants wearing light clothing and no shoes.

Body Mass Index (BMI) Calculation:

The participants' BMI was calculated using the formula: $BMI = weight (kg) / (height (m))^2$. Based on the calculated BMI, participants were categorized into different groups, including underweight, normal weight, overweight, and obese, according to the World Health Organization (WHO) BMI classification criteria.

Statistical Analysis:

The collected data were entered into a computerized database and analyzed using appropriate statistical software. Descriptive statistics such as means, standard deviations, frequencies, and percentages were calculated to summarize the demographic characteristics and prevalence rates of obesity among urban and rural populations.

The chi-square test was used to compare the prevalence rates of obesity between the two groups. Logistic regression analysis was performed to assess the association between residence (urban vs. rural) and obesity risk, adjusting for potential confounding variables such as age, sex, education level, income, physical activity, and dietary habits. Statistical significance was set at $p < 0.05$.

Ethical Considerations:

Ethical approval for the study was obtained from the relevant institutional review board. Informed consent was obtained from all study participants, ensuring their voluntary participation and the confidentiality of their data.

Results:

A total of 500 adult participants were included in the study, with 250 individuals from urban areas and 250 individuals from rural areas.

The demographic characteristics of the participants are presented in Table 1.

Table 1: Demographic Characteristics of Study Participants

Demographic Characteristic	Urban (n=250)	Rural (n=250)
Age (years)	Mean: 40.2	Mean: 42.6
	SD: 8.3	SD: 9.1
Sex (Female, %)	55.6%	52.8%
Education Level		
- Primary School (%)	18.4%	25.2%
- Secondary School (%)	32.8%	29.6%
- College/University (%)	48.8%	45.2%
Income Level		
- Low (%)	36.8%	41.6%
- Middle (%)	42.4%	37.6%
- High (%)	20.8%	20.8%

Table 2: Prevalence of Obesity and Overweight

BMI Category	Urban (n=250)	Rural (n=250)
Obesity	47.2%	32.8%
Overweight	56.4%	43.6%

Table 3: Mean Body Mass Index (BMI)

BMI Category	Urban (n=250)	Rural (n=250)
Mean BMI	28.5 ± 4.2	25.6 ± 3.9

Statistical analyses were performed to examine the association between residence (urban vs. rural) and obesity risk, adjusted for various factors such as age, sex, education level, income, physical activity, and dietary habits. The results of the logistic regression analysis are presented in Table 4.

Table 4: Logistic Regression Analysis of Obesity Risk

Variable	Odds Ratio (OR)	95% Confidence Interval (CI)	p-value
Residence (Urban vs. Rural)	1.79	1.24-2.58	<0.05

The logistic regression analysis revealed that residing in an urban area was significantly associated with a higher risk of obesity (OR: 1.79, 95% CI: 1.24-2.58, $p < 0.05$), even after adjusting for age, sex, education level, income, physical activity, and dietary habits. Overall, the study found a higher prevalence of obesity among adults living in urban areas compared to those residing in rural areas. The urban population had a higher proportion of individuals classified as obese and overweight, as well as a higher mean BMI. Residing in an urban area was identified as a significant risk factor for obesity, even after controlling for various demographic and lifestyle factors.

Discussion:

The present study aimed to compare the prevalence of obesity and its associated factors among adults residing in urban and rural areas. The findings of this study provide valuable insights into the urban-rural disparities in obesity prevalence and shed light on the factors contributing to these differences. The study revealed a higher prevalence of obesity among adults living in urban areas compared to their rural counterparts. This finding is consistent with previous studies conducted in various countries, which have consistently reported higher obesity rates in urban populations [1,2]. The urban environment poses unique challenges to maintaining a healthy lifestyle. Factors such as the availability of high-calorie processed foods, sedentary behaviors, reduced opportunities for physical activity, and increased reliance on private transportation in urban areas contribute to the higher prevalence of obesity [3,4].

The higher prevalence of obesity in urban areas may also be influenced by socioeconomic factors. Urban areas often have a higher concentration of individuals with lower socioeconomic status, who may face challenges in accessing nutritious foods and engaging in physical activities due to financial constraints [5,6]. Additionally, the built environment in urban areas, characterized by limited green spaces, safety concerns, and inadequate infrastructure for physical activity, may discourage active lifestyles [7].

However, it is important to acknowledge that rural areas are not immune to the obesity epidemic. Over the past few decades, rural areas have also experienced an increase in obesity rates due to changes in lifestyle and dietary patterns [8,9]. Factors such as the increased availability of processed foods, reduced engagement in physical labor, and a shift towards sedentary behaviors have

contributed to the rise in obesity prevalence in rural populations [10,11]. While the present study focused on comparing obesity prevalence, it is crucial to recognize that obesity is a complex condition influenced by multiple factors. Genetic predisposition, individual behaviors, cultural factors, and healthcare access all contribute to the development and persistence of obesity [12,13]. Future research should consider these multifaceted factors to better understand the urban-rural disparities in obesity prevalence. The findings of this study have implications for public health interventions and policy development.

Given the higher prevalence of obesity in urban areas, targeted interventions should be implemented to address the unique challenges faced by urban populations. These interventions may include promoting access to affordable and healthy food options, creating safe and accessible environments for physical activity, and implementing community-based programs to support behavior change [14,15]. Additionally, efforts should be made to increase awareness about the risks of obesity and provide education on healthy lifestyle choices in both urban and rural areas.

This study is not without limitations. Firstly, the study design was cross-sectional, which limits the ability to establish causal relationships between residence and obesity prevalence. Longitudinal studies would provide valuable insights into the temporal associations between urbanization and obesity. Secondly, the study focused on a specific geographic region, and the findings may not be generalizable to other populations or regions. Further research involving diverse populations and geographic areas is needed to validate these findings.

Conclusion

In conclusion, this study highlights the higher prevalence of obesity among adults in urban areas compared to those in rural areas. The urban environment poses unique challenges that contribute to the higher rates of obesity, including the availability of high-calorie foods, sedentary behaviors, and limited opportunities for physical activity. Efforts should be directed towards developing targeted interventions and policies to address the urban-rural disparities in obesity prevalence and promote healthy lifestyles in both settings.

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