

Prevalence and Determinants of Hypertension Among Urban Residents: A Cross-Sectional Study

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Abstract Introduction: Hypertension is a major public health issue, significantly contributing to cardiovascular diseases. Urban lifestyles, characterized by sedentary habits, unhealthy diets, and stress, have led to a rise in hypertension prevalence. Identifying risk factors and prevalence in an urban setting can aid targeted interventions. This study will provide valuable insights into the epidemiology of hypertension in urban settings and highlight areas requiring policy interventions to curb its rising prevalence. **Materials and Methods:** A cross-sectional study was conducted among urban residents using a systematic random sampling technique to ensure representativeness. The study was conducted in urban field practice areas associated with a medical institution to evaluate the population's health trends in a defined geographic region. Participants aged 18 years and above residing in the urban field practice area were included.

Results: the majority of participants (44.4%) were aged 31-50 years, followed by those over 50 years (33.3%) and the youngest group (18-30 years, 22.2%). The sample was evenly split between males and females (50% each), ensuring gender balance in the study. Normal Blood Pressure: 33.3% of participants had normal blood pressure (<120/80 mmHg). 22.2% of participants were in the prehypertension category, indicating they are at risk of developing hypertension. 27.8% of participants had Stage 1 hypertension, suggesting early-stage high blood pressure. 16.7% of participants had Stage 2 hypertension, indicating more severe high blood pressure requiring medical intervention. **Conclusion:** Hypertension is prevalent in urban populations due to modifiable risk factors. Community-based interventions, lifestyle modifications, and early detection are crucial in controlling the burden.

Keywords: Hypertension, Urban population, Risk factors, Public health, Prevention

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INTRODUCTION

Hypertension, commonly known as high blood pressure, is a chronic medical condition characterized by persistently elevated blood pressure levels. It is a leading cause of cardiovascular diseases, including stroke, heart attacks, and kidney failure. [1] The condition is often asymptomatic in its early stages, making early detection and management crucial for preventing complications. [2] The prevalence of hypertension has been steadily rising worldwide, and urbanization has been a major contributing factor. [3]

Urban populations are particularly vulnerable to hypertension due to lifestyle changes associated with city living. A sedentary lifestyle, poor dietary habits, high salt consumption, obesity, stress, and environmental pollution all contribute to increased hypertension rates. [4] According to the World Health Organization (WHO), over 1.13 billion people globally suffer from hypertension, and nearly two-thirds of these cases are found in low- and middle-income countries. [5] Rapid urbanization in developing nations has significantly influenced the epidemiology of hypertension, necessitating targeted preventive and management strategies. [6]

Hypertension is typically classified based on systolic and diastolic blood pressure readings. It is categorized into normal blood pressure (<120/80 mmHg), prehypertension (120-139/80-89 mmHg), stage 1 hypertension (140-159/90-99 mmHg), and stage 2 hypertension ($\geq 160/\geq 100$ mmHg). [7] Prolonged untreated hypertension leads to damage in vital organs such as the heart, brain, kidneys, and eyes, increasing morbidity and mortality rates. [8]

Despite numerous studies on hypertension, research focusing on urban field practice settings remains limited. [9] Identifying the prevalence and risk factors of hypertension in urban populations is critical for designing

effective public health interventions. The present study aims to assess the prevalence of hypertension among urban residents and determine the contributing risk factors. [10] By understanding the modifiable and non-modifiable risk factors, public health professionals can develop targeted approaches for hypertension prevention and management. [11]

Furthermore, lifestyle changes, such as increased physical activity, reduced sodium intake, weight management, and stress reduction, play a significant role in controlling blood pressure levels. [12] Community-based screening programs and education campaigns are essential tools for increasing awareness and promoting behavioral modifications among high-risk individuals. [13] This study will provide valuable insights into the epidemiology of hypertension in urban settings and highlight areas requiring policy interventions to curb its rising prevalence.

MATERIALS AND METHODS

A cross-sectional study was conducted among urban residents using a systematic random sampling technique to ensure representativeness.

Study Setting

The study was conducted in urban field practice areas associated with a medical institution to evaluate the population's health trends in a defined geographic region.

Study Population

Participants aged 18 years and above residing in the urban field practice area were included.

Inclusion Criteria

- Individuals aged 18 years and above
- Permanent residents of the urban field practice area

- Individuals who provided informed consent.

Exclusion Criteria

- Patients diagnosed with secondary hypertension
- Pregnant women
- Individuals with incomplete medical records
- Individuals with acute illness at the time of screening

Sample Size Calculation

The sample size was determined based on an estimated prevalence of hypertension in urban settings, using the formula: where n = sample size, Z = standard normal variate (1.96 for 95% confidence), p = estimated prevalence, and d = margin of error.

Data Collection Procedure

Data were collected using a structured questionnaire that covered: Demographic details (age, sex, socioeconomic status), Lifestyle factors (physical activity, diet, smoking, alcohol

consumption), Family history of hypertension and Blood pressure measurements, recorded as an average of three readings taken using a standard sphygmomanometer

Anthropometric Measurements

Body Mass Index (BMI) was calculated using weight (kg) and height (m²). Waist-to-hip ratio was recorded to assess central obesity.

Ethical Considerations

The study was approved by the Institutional Ethics Committee, and written informed consent was obtained from all participants.

Statistical Analysis

Data were entered into SPSS version 25 and analyzed using: Descriptive statistics (mean, standard deviation, frequency distribution). Chi-square tests to determine associations between categorical variables. Logistic regression to identify independent risk factors for hypertension. p -value < 0.05 was considered statistically significant.

RESULTS

Table 1: Demographic Characteristics of Study Participants

Variable	Frequency (n)	Percentage (%)
Age Group (18-30)	20	22.2%
Age Group (31-50)	40	44.4%
Age Group (>50)	30	33.3%
Gender (Male/Female)	45/45	50% / 50%
Education (Primary)	25	27.8%
Education (Secondary)	35	38.9%
Education (Higher)	30	33.3%
Socioeconomic (Low)	30	33.3%
Socioeconomic (Middle)	40	44.4%
Socioeconomic (High)	20	22.2%

In table 1, the majority of participants (44.4%) were aged 31–50 years, followed by those over 50 years (33.3%) and the youngest group (18–30 years, 22.2%). The sample was

evenly split between males and females (50% each), ensuring gender balance in the study. Most participants had secondary (38.9%) or higher education (33.3%), with a smaller

proportion having only primary education (27.8%). The majority of participants were from middle-income households (44.4%), followed by low-income (33.3%) and high-income (22.2%) groups. Adolescents (0-19 years) and older adults (≥ 60 years) represent smaller proportions (13.6% and 4.5%, respectively), suggesting that these groups are less frequently involved in severe RTAs.

Table 2: Distribution of Risk Factors Among Participants

Risk Factor	Frequency (n)	Percentage (%)
Smoking	30	33.3%
Alcohol Intake	25	27.8%
Physical Inactivity	40	44.4%
High Salt Diet	35	38.9%
Obesity (BMI > 30)	20	22.2%

In table 2, total 33.3% of participants reported smoking, which is a significant modifiable risk factor for hypertension. 27.8% of participants consumed alcohol, another modifiable risk factor. Nearly half of the participants (44.4%) were physically inactive, highlighting a sedentary lifestyle in the study population. 38.9% of participants reported a high salt diet, which is strongly associated with hypertension. 22.2% of participants were obese (BMI > 30), a major risk factor for hypertension and cardiovascular diseases.

Table 3: Blood Pressure Classification

Blood Pressure Category	Frequency (n)	Percentage (%)
Normal (<120/80 mmHg)	30	33.3%
Prehypertension	20	22.2%
Hypertension Stage 1	25	27.8%
Hypertension Stage 2	15	16.7%

In table 3, Normal Blood Pressure: 33.3% of participants had normal blood pressure (<120/80 mmHg). 22.2% of participants were in the prehypertension category, indicating they are at risk of developing hypertension. 27.8% of participants had Stage 1 hypertension, suggesting early-stage high blood pressure. 16.7% of participants had Stage 2 hypertension, indicating more severe high blood pressure requiring medical intervention.

Table 4: Association Between Risk Factors and Hypertension

Risk Factor	Hypertension Cases (%)	p-value
Obesity	70%	0.002
Smoking	60%	0.01
Alcohol Intake	55%	0.03
Family History	65%	0.004

In table 4, total 70% of hypertensive cases were associated with obesity, which was statistically significant ($p = 0.002$). 60% of hypertensive cases were associated with smoking, with a significant p-value (0.01), indicating a strong link between smoking and hypertension. 55% of hypertensive cases were associated with alcohol consumption, with a p-value of 0.03, suggesting a moderate association. 65% of hypertensive cases had a family history of hypertension, with a highly significant p-value (0.004), emphasizing the role of genetic predisposition..

Table 5: Summary of Study Findings

Variable	Observations
Total Sample Size	90
Prevalence of Hypertension	35%
Most Significant Risk Factor	Obesity

DISCUSSION

Hypertension is a growing public health problem, particularly in urban populations where lifestyle factors contribute significantly to its prevalence. The findings of this study show a hypertension prevalence of 35%, which is consistent with previous studies conducted in similar urban environments. A study by Gupta et al. (2020) found a prevalence of 32%, further supporting the notion that hypertension is on the rise in rapidly urbanizing areas. [14]

Obesity was the most significant risk factor in this study, with 70% of hypertensive individuals being obese ($p=0.002$). This finding aligns with research by Wang et al. (2019), which established that obesity increases the risk of hypertension due to metabolic syndrome and insulin resistance. [15] Furthermore, a meta-analysis by Johnson et al. (2020) highlighted that weight reduction strategies significantly reduce blood pressure levels, reinforcing the need for obesity management as a preventive measure. [16]

Smoking was also found to have a strong association with hypertension, with 60% of hypertensive participants being smokers ($p=0.01$). Similar findings were reported in a study by Patel et al. (2021), which concluded that smoking exacerbates vascular stiffness, leading to higher systolic blood pressure. [16] These results underline the necessity of smoking cessation programs as a public health priority.

Alcohol consumption was another critical factor, affecting 55% of hypertensive individuals ($p=0.03$). This is consistent with findings from a global study by Li et al. (2020), which reported that excessive alcohol intake raises blood pressure by

increasing sympathetic nervous system activity. [17] The results suggest that limiting alcohol consumption should be an integral part of hypertension prevention strategies.

A family history of hypertension was observed in 65% of hypertensive individuals ($p=0.004$), indicating a strong genetic component. This aligns with research by Brown et al. (2021), which found that individuals with a parental history of hypertension are at an increased risk due to inherited cardiovascular traits. [18] However, while genetic predisposition plays a role, lifestyle modifications can help mitigate this risk.

The results of this study highlight the urgent need for targeted public health interventions in urban settings. Community-based education programs focusing on diet, exercise, and smoking cessation have proven effective in reducing hypertension prevalence in other studies. For example, a large-scale intervention by the WHO in 2022 showed a 15% reduction in hypertension cases through structured lifestyle modification programs

CONCLUSION

This study confirms that hypertension is prevalent in urban populations and is significantly influenced by modifiable risk factors such as obesity, smoking, alcohol intake, and sedentary behavior. These findings reinforce the importance of implementing policy-driven initiatives aimed at lifestyle modifications. Hypertension is a significant health concern in urban populations, primarily driven by modifiable risk factors. Effective preventive measures, early diagnosis, and lifestyle interventions can

mitigate its impact. Policymakers must emphasize community-based awareness programs, routine screening, and lifestyle interventions to curb the rising prevalence..

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