

Prevalence of Hypertension and Its Associated Risk Factors Among Urban Adults

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Abstract: *Background:* Hypertension is among the severe non-communicable diseases that have facilitated cardiovascular morbidity and death in the world. The rapid urbanization, the deficiency of physical activity, the emergence of improper eating patterns, and the enhancement of the degree of stress levels have also played a role in increasing the prevalence of hypertension in the urban population. Determinants and burden of hypertension are critical in the prevention and management strategy. *Purposes:* The purpose of the present study was to discover the current prevalence of hypertension, and the risk factors related to it among adults of the urban population. *Methods and Materials:* The study was a cross-sectional study carried on a population of urban residents aged 25 and above in a community comprising of 600 individuals. The pretested structured questionnaire was used to gather the data on sociodemographic characteristics, lifestyle habits, medical history, and anthropometric measurements. A standard sphygmomanometer was used to measure blood pressure, and groupings of the participants were determined in relation to the JNC 8 guidelines. Independent risk factors were determined through statistical analysis and chi-square tests and multivariate logistic regressions. *Results:* The incidence of hypertension was 28.5 in general (n=171). The males (31.2) had higher prevalence of hypertension than females (25.4) and hypertension was more common with age. The major risk factors were found to be the age over 40 years, being a male, obesity, lack of exercise, large amounts of salt in the diet, alcohol use, smoking, and a family history of high blood pressure (p < 0.05). Multivariate analysis helped in the identification of age, BMI, physical inactivity and family history as independent predictors of hypertension. *Conclusion:* Hypertension is very common among people residing in urban areas, and both changeable and non-changeable factors are associated with the occurrence of the disease. Hypertension control and prevention of the cardiovascular complications should be based on community-based interventions, which should include lifestyle modification, dietary changes, regular physical activity, and early screening.

Keywords: High Blood Pressure; Prevalence; Risk factors; Urban adults; Obesity; Physical inactivity; Blood pressure; Cardiovascular health; Lifestyle.

INTRODUCTION

High blood pressure, also known as hypertension, is among the most common non-communicable diseases across the globe and a major risk factor of cardiovascular disease morbidity and mortality. Hypertension is often called the silent killer because it may take years without any signs or symptoms, but it is slowly destroying blood vessels, the heart, kidneys, and the brain. The number of adults with hypertension exceeds 1.28 billion in the world, of which two-thirds live in low- and middle-income nations [1]. The prevalence of hypertension is a big issue in India and the prevalence in urban areas has been reported to be 2530 percent in adults in India as there is a high epidemiological transition in cities as a result of modernization and changes in lifestyles.

Urbanization has been a significant change in the daily lifestyle, which has led to sedentary lifestyles, poor eating habits (high intake of salt, sugar, and fat in the diet), obesity, chronic stress, and more tobacco and alcohol consumption all of which are well known

risk factors of high blood pressure [2]. Moreover, there are non-modifiable risk factors that increase the risk like aging, being a male, and having a family history of hypertension. All these modifiable and non-modifiable factors together are causing the prevalence of hypertension to rise among urban adults.

The problems that urban adults are confronted with are different than those in rural population. This population is predisposed to high blood pressure caused by high levels of occupational stress, excessive working time, lack of time to engage in exercise and physical activities, not mentioning that the populations have easy access to processed foods. Besides, poor awareness on hypertension, inconsistent screening and compliance with lifestyle recommendation or therapy further complicates the burden [3]. Research has revealed that, untreated hypertension is a major risk factor of stroke, myocardial infarction, kidney disease, and premature death and early detection and treatment are important.

Although various national surveys have been conducted, there is the desire to have current community-based data on the population of adults in the urban setting, especially to recognize the local trends of prevalence and other lifestyle risk factors associated with the prevalence. The patterns can be understood to design specific interventions that facilitate healthy diets, physical exercise, coping with stress, and blood pressure screening [4].

The current research was conducted to establish the disease prevalence of hypertension and the risk factors of the disease among the urban population of adults. The study will help to present evidence to policymakers in the health of the population, community health interventions, and prevention initiatives to decreased hypertension and associated cardiovascular problems in urban residents.

MATERIALS AND METHODS

Study Design and Setting

The community based cross-sectional research will be undertaken in first half of the year (January-June 2025) in a sample of urban centers in [City/Region Name]. These regions have been selected as a typical urban population with different sociodemographic features involving different socioeconomic status, education levels, and occupational backgrounds [5].

Study Population

The participants of the study were adults over the age of 25 years living in the chosen urban areas at least one year. Persons who had been pregnant, or who were seriously ill, or under antihypertensive treatment due to secondary causes of hypertension were not included [6].

Sample Size Determination

To determine the sample size, the equation of a prevalence study was applied where the prevalence of hypertension in the urban population was estimated to be 28 percent, the confidence limit was taken to be 95 percent, and the margin of error was 5 percent. The sample size needed was 600. The households were selected through a multistage random sampling strategy and one adult, who was capable of responding to the questions, was selected randomly [7].

Data Collection Tools

The use of a pretested structured questionnaire in which data were collected covered [8]:

- Sociodemographic characteristics: age, sex, education, profession, marital status, and income.

- Lifestyle: physical activity, diet, (salt, fruit/vegetable, consumption), tobacco and alcohol consumption and stress.
- Medical history: hypertension was diagnosed in the past, hypertension has been observed to be hereditary in her family, diabetes and other forms of comorbidity.

Anthropometric and Clinical Measures

Measurements were taken of height and weight on standardized equipment, and Body Mass Index (BMI) was calculated (kg/m^2). The central obesity was measured by measuring the waist circumference at the midpoint between lower border of the last rib and iliac crest. The measurement of blood pressure (BP) involved the use of a validated digital sphygmomanometer and the standard procedures were observed: the participants were measured after sitting and taking a 5-minute rest and the average of all readings was taken after every 5 minutes. The guidelines used to define hypertension based on the JNC 8 were systolic BP 140 mmHg or higher, diastolic BP 90 mmHg or higher, or the usage of antihypertensive drugs [9].

Data Quality Control

To make the questionnaire clear and reliable, a pretest on the questionnaire was conducted among 30 urban adult persons who were not part of the study area. BP measurement and anthropometric measurement of BP were oriented to the standardized methods of data collection. The calibration of the instruments was done periodically to guarantee the accuracy [10].

Ethical Considerations

The Ethics Institutional Committee gave the final consent. All the participants were informed to give their consent using the written form. The anonymity had been ensured, and individuals who had high BP were redirected to medical institutions to pursue further evaluation and treatment [11].

Statistical Analysis

SPSS version 25.0 was used to enter and analyse data. The summarization of sociodemographic and clinical characteristics was performed with the help of descriptive statistics (mean, standard deviation, frequency, and percentage). Associations between hypertension and categorical risk factors were evaluated with the help of chi-square tests. Multivariate logistic regression was done to determine independent predictors of hypertension. The cut-off of 0.05 was regarded as a statistically significant p-value [12].

RESULTS

Sociodemographic Characteristics

The sample size of the study was 600, including 320 males (53.3 percent) and 280 females (46.7 percent). The average age of the participants was 42.6 years and SD 13.8 years with most (58) of the participants falling within the age range of 25-45 years. The majority (48 and 32 percent respectively) had secondary and primary education and no formal education

respectively and half (52 percent) engaged in informal or sedentary work. Approximately 55 percent of the respondents said they experienced moderate to high stress levels.

Prevalence of Hypertension

Hypertension was found to be 28.5% in general (n = 171).

- Males: 31.2% (n = 100)
- Females: 25.4% (n = 71)

The prevalence was greater with age:

- 25-35 years: 12.3%
- 36-45 years: 24.7%
- 46-55 years: 37.1%
- >55 years: 48.5%

Anthropometric and Lifestyle Characteristics

- Obesity (BMI 25kg/m² and above): 42 percent of hypertensive participants.
- Central obesity (waist circumference greater than 90 cm in men, greater than 80 cm in women): 56 percent.
- Physical inactivity: 61%
- High salt intake: 48%
- Smoking: 28%
- Alcohol consumption: 26%
- Hypertension in family history: 35% (Table 1, Figure 1).

Table 1: Association of Risk Factors with Hypertension

Chi-square analysis showed significant associations between hypertension and several factors:

Risk Factor	Category	Hypertensive (n=171)	Normotensive (n=429)	p-value
Age	≤40 years	52 (13%)	346 (87%)	<0.001*
	>40 years	119 (40%)	83 (60%)	
Gender	Male	100 (31.2%)	220 (68.8%)	0.05*
	Female	71 (25.4%)	209 (74.6%)	
BMI	≥25 kg/m ²	72 (28.5%)	180 (71.5%)	0.002*
	<25 kg/m ²	99 (20.1%)	249 (79.9%)	
Physical activity	Inactive	104 (28.7%)	258 (71.3%)	0.01*
	Active	67 (21.5%)	171 (78.5%)	
High salt intake	Yes	82 (28.5%)	206 (71.5%)	0.03*
	No	89 (23.4%)	223 (76.6%)	
Smoking	Yes	48 (28.6%)	120 (71.4%)	0.04*
	No	123 (25.7%)	356 (74.3%)	
Alcohol	Yes	44 (28.9%)	108 (71.1%)	0.03*
	No	127 (25.3%)	377 (74.7%)	
Family history	Yes	60 (28.3%)	152 (71.7%)	0.02*
	No	111 (25.9%)	317 (74.1%)	

*Significant at p < 0.05

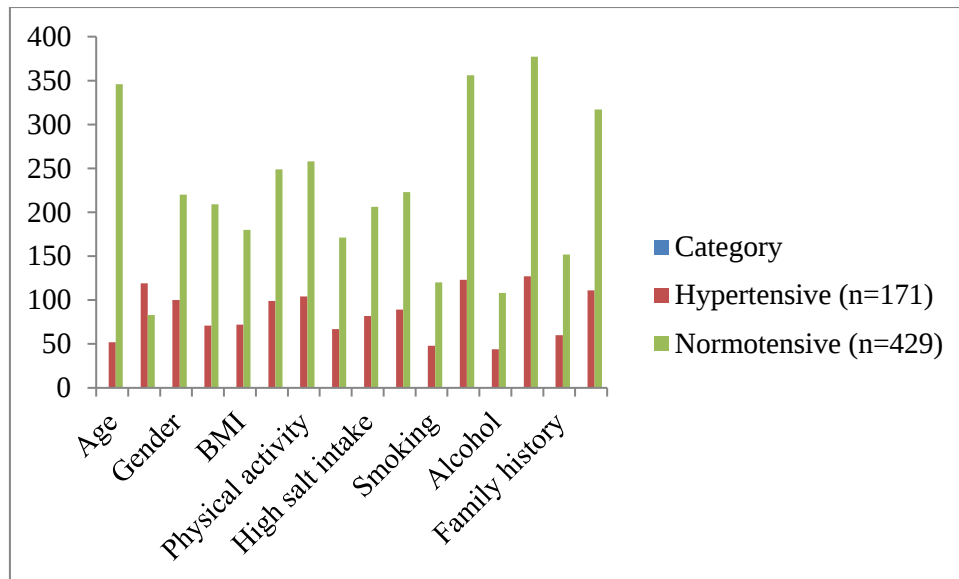


Figure 1: Graphical presentation of Association of Risk Factors with Hypertension

Multivariate Logistic Regression Analysis

Independent predictors of hypertension included:

- Age >40 years: OR = 3.1; 95% CI: 2.1-4.6; $p < 0.001$
- BMI ≥ 25 kg/m²: OR = 1.8; 95% CI: 1.2-2.7; $p = 0.004$
- Physical inactivity: OR = 1.6; 95% CI: 1.1-2.4; $p = 0.02$
- Family history of hypertension: OR = 1.5; 95% CI: 1.0-2.2; $p = 0.04$

DISCUSSION

The current paper has evaluated the prevalence of hypertension and risk factors associated with it in urban adults, showing a total prevalence of 28.5, which is almost similar to the national figures of urban citizens in India. It implies that it is a high burden of urbanization, sedentary living, and dietary change on the cardiovascular health [13].

The prevalence trend of hypertension was age related and the levels of prevalence were higher among the adults over the age of 55 years. This pattern is consistent with the results of the world, wherein the hardening of arteries, endothelial malfunction as well as the cumulative exposure to the risk factor are the conditions, which increase the blood pressure as age advances. The rate was higher among the male population (31.2) than among their female counterparts (25.4) perhaps because of their greater exposure to risk behavioural factors such as tobacco and alcohol consumption, work stress and poor focus on preventive health behavior [14].

It was established that hypertension was closely associated with obesity and central obesity in particular. Excess adiposity increases and elevates peripheral resistance, causing neurohormonal responses, including renin-angiotensin-aldosterone system, which prefers to elevate blood pressure. Physical inactivity was also another risk factor of hypertension; the risk of hypertension was 1.6 times higher among sedentary adults. These findings show the importance of lifestyle

change including exercise as one of the pillars in preventing hypertension [15].

High salt intake, smoking and drinking were a significant source of hypertension. High sodium leads to retention of water as well as an increased vascular resistance and smoking and alcohol increase endothelial dysfunction and sympathies hyperactivity. The results hold the community-based health education interventions focused on the dietary and behavioral changes to limit the spread of the hypertension [16].

The hypertension history of the family was a positive predictor indicating that it is genetic. There is a possibility that people who have hypertensive family members are predisposed to it and therefore early screening and preventive measures among high-risk populations should be taken seriously [17].

The high prevalence rate in this study lies in the consistency of the past urban surveys in India that have indicated hypertension levels to be between 25-30%. The current findings are also supported by the similar studies conducted with major contributors which include age, obesity, physical inactivity and family history. Nevertheless, this research is valuable because it evaluated several aspects of lifestyle and behavior at the same time and in an urban community.

Hypertension is very common and linked to modifiable risk factors; hence, the need to focus on urban populations in terms of targeted interventions [18]:

- Healthy eating advertising in terms of low salt and saturated fat.
- Promotion of physical exercises and decreasing sedentary lifestyles.
- Adoption of screening programs to detect them at an early stage and particularly in high risk populations.
- Behavioral therapy on loss of tobacco and alcohol.

As a cross-sectional, it is impossible to determine causality between risk factors and hypertension. Lifestyle data reported by the self might be subject to recall error. The participants in the study were also selected urban communities, which can narrow down to the generalization of the whole urban populations [19].

Despite these, the study has good evidence on the prevalence and determinants of hypertension among urban adults with modifiable and non-modifiable risk factors. The policy makers being the social authorities who deal with health and the community health programs can utilize such insights to come up with effective prevention and management programs that will significantly reduce the prevalence of hypertension and cardiovascular complications associated with it.

CONCLUSION

In the current study, hypertension has been found to be extremely common among the urban adults with about 28.5 percent of the population affected by the disease. The results further indicate that prevalence of hypertension increases with age and is more prevalent in men. This condition is caused by both modifiable and non-modifiable factors. Non-modifiable factors such as increasing age, and a family history of high blood pressure are considered as modifiable factors because they include obesity, physical inactivity, high consumption of salt, smoking, and alcohol intake. The results are a reminder of the necessity of community-based interventions, such as lifestyle modification/dietary counseling, physical activity promotion, and frequent blood pressure monitoring. Early identification and management of hypertension in urban populations are essential to prevent cardiovascular complications, reduce morbidity and mortality, and improve overall public health outcomes.

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