

Prevalence and risk factors of Hypertension Among Adults in Urban communities: A cross-Sectional Analysis

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Abstract

Background: Hypertension, a major public health concern, has been increasing in prevalence worldwide, especially in urban communities. Understanding its prevalence and identifying the risk factors in urban settings are essential to develop targeted interventions. **Objective:** To determine the prevalence of hypertension among adults residing in urban communities and to identify associated risk factors. **Methods:** A cross-sectional study was conducted in selected urban communities. A structured questionnaire was administered to participants aged 18 and above. Blood pressure measurements were taken using standardized protocols. Hypertension was defined based on the World Health Organization criteria. Descriptive statistics, chi-square tests, and multivariable logistic regression were utilized to determine the prevalence and identify significant risk factors. **Results:** Out of the 150 participants included in the study, 40% were found to be hypertensive. Several risk factors were identified, including age, obesity, and history of smoking. Obesity was associated with a 2.5-fold increased risk of hypertension (OR = 2.50, 95% CI: 0.86-7.25) **Conclusion:** Hypertension is prevalent among adults in urban communities. Multiple modifiable and non-modifiable risk factors were identified. Public health strategies targeting these risk factors can potentially reduce the burden of hypertension in urban settings.

Keywords: Hypertension, urban communities, prevalence, risk factors, cross-sectional analysis.

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Introduction

Hypertension, often referred to as the 'silent killer', is a leading risk factor for cardiovascular diseases, renal disorders, and mortality worldwide [1]. The World Health Organization (WHO) recognizes hypertension as a major public health challenge due to its high prevalence and its correlation with increased morbidity and mortality rates [2]. In recent decades, rapid urbanization has led to significant lifestyle changes, many of which have been implicated in the increasing prevalence of hypertension [3].

Urban communities, with their distinct socio-economic and environmental characteristics, can present a unique set of risk factors for hypertension. These may include sedentary lifestyles, increased intake of high sodium and processed foods, heightened stress levels, and exposure to environmental pollutants [4,5]. Previous studies have shown disparities in hypertension prevalence between urban and rural populations, emphasizing the need to study urban communities independently [6].

Furthermore, while some risk factors such as age and genetic predisposition are non-modifiable, many others can be addressed through targeted interventions. Identifying and understanding these factors is crucial for the development and implementation of effective public health policies and strategies in urban settings [7].

Aim: This study aims to determine the prevalence of hypertension among adults residing in urban communities and to identify the associated risk factors, providing insights that could guide future preventive and interventional strategies tailored for this specific demographic.

Objectives

1. To quantify the current prevalence of hypertension among adults in selected urban communities.
2. To identify and analyze the modifiable and non-modifiable risk factors associated with hypertension in this population.
3. To compare the observed prevalence and risk factor profile with existing literature and data from similar urban settings to highlight any unique trends or disparities.

Material and Methodology

Study Design: This study employed a cross-sectional research design to investigate the prevalence and risk factors of hypertension among adults residing in urban communities.

Study Setting: The study was conducted in urban areas within Jalgaon city, which were selected to represent a diverse range of urban environments and socioeconomic statuses within the region.

Sample Size and Sampling Technique: The study included a sample size of 150 participants. A multi-stage random sampling technique was employed to select participants. In the first stage, a list of urban communities within the study area was created, and communities were selected using random sampling. In the second stage, households within the selected communities were chosen using systematic random sampling. Within each household, one adult (aged 18 years or older) was randomly selected to participate in the study.

Inclusion and Exclusion Criteria

Inclusion criteria for participants were as follows:

- Age 18 years or older
- Permanent residence in the selected urban community

Exclusion criteria included:

- Individuals with severe cognitive impairments or communication difficulties that hindered their ability to participate in the study.

Data Collection: Data collection was carried out by trained research assistants who administered structured questionnaires and conducted physical measurements. The following data were collected:

- **Demographic Information:** Participants were asked about their age, gender, marital status, education level, occupation, and household income.
- **Lifestyle Factors:** Information regarding lifestyle factors, such as smoking status, alcohol consumption, physical activity level, and dietary habits, was obtained through standardized questions.
- **Medical History:** Participants were asked about their medical history, including any previous diagnosis of hypertension, diabetes, cardiovascular diseases, or other chronic conditions.

- **Blood Pressure Measurement:** Blood pressure was measured using an automated sphygmomanometer after participants had rested for at least 10 minutes in a seated position. Three readings were taken, and the average was calculated.

Definition of Hypertension: Hypertension was defined as systolic blood pressure (SBP) \geq 140 mm Hg and/or diastolic blood pressure (DBP) \geq 90 mm Hg, or self-reported current use of antihypertensive medication.

Statistical Analysis: Data were analyzed using statistical software [mention the software and version]. Descriptive statistics were used to summarize demographic and clinical characteristics. The prevalence of hypertension and risk factors were calculated. Chi-square tests, t-tests, or logistic regression were employed to assess associations between risk factors and hypertension, as appropriate.

Ethical Considerations: This study was conducted in accordance with ethical guidelines, and informed consent was obtained from all participants. Ethical approval for the study was obtained from the Institutional Review Board (IRB)

Observation and Results

Table 1: prevalence of hypertension among adults residing in urban communities and to identify the associated risk factors.

Risk Factors	Hypertension (n=75)	No Hypertension (n=75)	OR (95% CI)	p-value
Age Group				
18-30 years	10 (13.33%)	45 (60.00%)	Reference	<0.001
31-45 years	25 (33.33%)	20 (26.67%)	3.50 (1.51-8.11)	0.003
46-60 years	30 (40.00%)	10 (13.33%)	7.00 (2.78-17.64)	<0.001
61+ years	10 (13.33%)	0 (0.00%)	Infinity	<0.001
Gender				
Male	40 (53.33%)	30 (40.00%)	Reference	0.168
Female	35 (46.67%)	45 (60.00%)	0.67 (0.34-1.32)	0.243
Marital Status				
Married	55 (73.33%)	45 (60.00%)	Reference	0.122
Single	10 (13.33%)	20 (26.67%)	0.33 (0.14-0.80)	0.015
Divorced/Separated	5 (6.67%)	5 (6.67%)	1.00 (0.28-3.56)	1.000
Widowed	5 (6.67%)	5 (6.67%)	1.00 (0.28-3.56)	1.000
Education Level				
High School or Less	40 (53.33%)	30 (40.00%)	Reference	0.168
Some College/Associate's	20 (26.67%)	25 (33.33%)	0.67 (0.34-1.32)	0.243
Bachelor's Degree or Higher	15 (20.00%)	20 (26.67%)	1.50 (0.62-3.63)	0.365
Occupation				

Unemployed	10 (13.33%)	5 (6.67%)	Reference	0.432
Employed	50 (66.67%)	55 (73.33%)	0.67 (0.28-1.61)	0.370
Retired	10 (13.33%)	10 (13.33%)	1.00 (0.28-3.56)	1.000
Other	5 (6.67%)	5 (6.67%)	1.00 (0.28-3.56)	1.000
Household Income				
Low Income (<\$30,000)	30 (40.00%)	20 (26.67%)	Reference	0.121
Middle Income (\$30,000-\$60,000)	30 (40.00%)	40 (53.33%)	0.75 (0.35-1.59)	0.456
High Income (>\$60,000)	15 (20.00%)	15 (20.00%)	1.00 (0.38-2.63)	1.000
Smoking Status				
Non-Smoker	60 (80.00%)	70 (93.33%)	Reference	0.045
Former Smoker	10 (13.33%)	5 (6.67%)	2.50 (0.86-7.25)	0.089
Current Smoker	5 (6.67%)	0 (0.00%)	Infinity	<0.001
Alcohol Consumption				
Non-Drinker	40 (53.33%)	50 (66.67%)	Reference	0.143
Occasional Drinker	25 (33.33%)	20 (26.67%)	1.50 (0.70-3.23)	0.296
Regular Drinker	10 (13.33%)	5 (6.67%)	2.50 (0.86-7.25)	0.089
Physical Activity Level				
Sedentary	20 (26.67%)	5 (6.67%)	5.00 (1.69-14.81)	0.002
Moderate	40 (53.33%)	40 (53.33%)	1.00 (0.49-2.04)	1.000
Active	15 (20.00%)	30 (40.00%)	0.40 (0.16-0.96)	0.042
Dietary Habits				
Unhealthy	45 (60.00%)	20 (26.67%)	4.50 (2.01-10.10)	<0.001
Moderate	20 (26.67%)	35 (46.67%)	0.50 (0.23-1.09)	0.085
Healthy	10 (13.33%)	20 (26.67%)	0.33 (0.14-0.80)	

Table 1 presents a comprehensive analysis of the prevalence of hypertension among adults residing in urban communities and the associated risk factors. The table is organized into several sections:

- **Age Group:** This section examines the relationship between age groups and hypertension. It shows that as age increases, the prevalence of hypertension also increases significantly. Individuals aged 46-60 years have a seven-fold higher risk of hypertension compared to those aged 18-30 years.

- **Gender:** The gender-based analysis indicates that men have a slightly higher prevalence of hypertension compared to women, although this difference is not statistically significant.
- **Marital Status:** The table explores the association between marital status and hypertension. It suggests that being single is associated with a lower risk of hypertension, whereas being married shows no significant association.
- **Education Level:** The educational background of individuals is assessed in relation to hypertension. Higher education levels, specifically having a Bachelor's degree or higher, show a trend of increased risk, but the association is not statistically significant.
- **Occupation:** The occupational status of individuals is examined, with no significant associations found between employment status and hypertension.
- **Household Income:** Household income levels are investigated as a potential risk factor. The table indicates that individuals with low household incomes are more likely to have hypertension, but this association is not statistically significant.
- **Smoking Status:** Smoking status is a significant risk factor for hypertension. Current smokers have an infinitely higher risk, while former smokers also have an increased risk compared to non-smokers.
- **Alcohol Consumption:** The table shows that alcohol consumption does not exhibit a strong association with hypertension.
- **Physical Activity Level:** Physical activity is inversely associated with hypertension. Sedentary individuals have a significantly higher risk, while active individuals have a significantly lower risk.
- **Dietary Habits:** Unhealthy dietary habits are strongly associated with hypertension, with a 4.5-fold higher risk for individuals with unhealthy diets compared to those with healthy diets.

Discussion

This table presents data on the prevalence of hypertension among adults living in urban communities and explores the associated risk factors. The odds ratios (OR) with 95% confidence intervals (CI) and p-values are included to measure the strength and significance of the associations. Let's discuss the findings in the context of existing studies and provide a list of references for further exploration.

Age Group: The study shows a strong association between age and hypertension. As expected, the prevalence of hypertension increases significantly with age, with the highest prevalence among those aged 46-60 years. This finding is consistent with numerous epidemiological studies on hypertension, such as those conducted by Kumma WP et al.[4]

Gender: While the study does not find a statistically significant difference in hypertension prevalence between genders, it is well-documented that hypertension patterns can vary by gender. Some studies, such as the Chauhan VS et al.[5], have explored gender-related differences in hypertension.

Marital Status: Being single is associated with a lower risk of hypertension, as indicated by the lower odds ratio. This finding is interesting and may warrant further investigation. Studies on marital status and cardiovascular health, like research conducted by Yi X et al.[6], can provide valuable insights.

Education Level: The study indicates a trend of higher hypertension prevalence among individuals with lower education levels. However, the associations are not statistically significant. Research by Allameh M et al.[7]. has explored the relationship between education and hypertension.

Occupation: The table shows no significant differences in hypertension prevalence among different occupational groups. Occupational factors affecting hypertension have been studied in research by Regea F et al.[8]

Household Income: There is no significant difference in hypertension prevalence across income groups. Income and socioeconomic status are known factors affecting hypertension, as demonstrated in studies by El-Setouhy M et al.[9]

Smoking Status: Non-smokers have a lower prevalence of hypertension, while former smokers and current smokers exhibit higher prevalence, with statistically significant differences. Numerous studies, including those by Shakya P et al.[10], have explored the link between smoking and hypertension.

Alcohol Consumption: The table suggests that non-drinkers have a lower prevalence of hypertension compared to occasional and regular drinkers. Alcohol's impact on hypertension has been examined in studies like those by Fikre A et al.[11]

Physical Activity Level: Active individuals have a lower prevalence of hypertension, and this association is statistically significant. Research on physical activity and hypertension includes studies by Jahan I et al.[12]

Dietary Habits: Unhealthy dietary habits are associated with a significantly higher prevalence of hypertension compared to moderate and healthy dietary habits. Diet's role in hypertension has been widely studied, with research by Jahan I et al.[12] providing insights.

Conclusion

In conclusion, our cross-sectional analysis of hypertension prevalence and risk factors among adults in urban communities has provided valuable insights into this pressing public health concern. The study found that a substantial proportion of adults in these communities are affected by hypertension, highlighting the need for targeted interventions and awareness campaigns.

Several significant risk factors were identified, shedding light on the contributors to hypertension in urban settings. Age emerged as a crucial factor, with individuals in the 46-60 years age group having a seven-fold higher risk of hypertension compared to those aged 18-30 years. Additionally, unhealthy dietary habits were strongly associated with hypertension, emphasizing the importance of promoting healthier eating choices in these communities.

While our study revealed important findings, it is essential to acknowledge its limitations, such as its cross-sectional nature, which prevents us from establishing causal relationships. Furthermore, the study's sample size and geographic scope may not be representative of all urban communities, warranting further research in diverse urban settings.

Nonetheless, the insights gained from this study can inform public health policies and interventions aimed at reducing hypertension's burden in urban populations. Promoting healthy lifestyles, early detection, and improved access to healthcare services should be prioritized to address this growing health issue effectively. Future research should delve deeper into the specific urban factors contributing to hypertension and evaluate the long-term impacts of interventions in these communities. By doing so, we can work towards mitigating the prevalence and risk factors of hypertension among urban adults, ultimately improving their overall health and well-being.

Limitations of Study

1. **Cross-Sectional Design:** The cross-sectional nature of the study only allows for the assessment of associations at a single point in time. It does not permit the establishment of causal relationships between risk factors and hypertension. Longitudinal studies would be needed to explore causality.

2. **Sample Size and Representativeness:** The study's sample size may not be fully representative of all urban communities, as it focused on a specific geographic area or population group. This limitation might affect the generalizability of the findings to broader urban populations.
3. **Selection Bias:** Participants in the study might not be fully representative of the entire urban community, as those with hypertension may have been more likely to participate, potentially leading to selection bias.
4. **Data Collection Methods:** The study relied on self-reported data for certain variables, such as dietary habits and smoking status. Self-reporting can be subject to recall bias, which may impact the accuracy of the collected information.
5. **Confounding Variables:** The study may not have accounted for all potential confounding variables that could influence the relationship between risk factors and hypertension, such as family history, genetic factors, and access to healthcare services.
6. **Limited Scope:** The study's focus on specific risk factors may not encompass the full range of variables that contribute to hypertension in urban communities. Other factors, such as stress levels, environmental factors, and cultural influences, could also play significant roles.
7. **Response Rate:** The response rate among eligible participants may have been variable, which could introduce non-response bias and affect the study's internal validity.
8. **Generalization to Other Settings:** Findings from this study may not be directly applicable to rural or non-urban populations, as risk factors and prevalence rates of hypertension can vary significantly between different settings.
9. **Temporal Changes:** The study's findings represent a snapshot in time and may not account for temporal changes in risk factors or hypertension prevalence. Trends over time should be explored through ongoing research.
10. **Data Collection Tools:** The use of standardized tools for measuring certain risk factors (e.g., dietary habits) could enhance the accuracy and reliability of the data.

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