© OCT 2025 | IRE Journals | Volume 9 Issue 4 | ISSN: 2456-8880
DOI: https://doi.org/10.64388/IREV9I4-1711616

Assessment of the Environmental Health Risk Factors Associated with the Prevalence of Hypertension Disorder Among Patients Attending the Civil Service Hospital, Ilorin, Kwara State.

OYINLOYE OYETOLA MOYINOLUWA[1], SHESHI A. A[2]
[1, 2]*Department of Environmental Health, Kwara State University, Malete*

***Abstract-** Hypertension remains one of the most widespread non-communicable diseases (NCDs) globally and continues to be a leading cause of morbidity and mortality, particularly in low- and middle-income countries. Its development and persistence are influenced not only by genetic and lifestyle factors but also by environmental health determinants such as air and noise pollution, poor housing quality, sanitation challenges, and exposure to psychosocial stressors. This study examined the environmental health risk factors associated with the prevalence of hypertension among adult patients attending the Civil Service Hospital, Ilorin, Kwara State, Nigeria. A cross-sectional descriptive research design was employed, and a total of 250 adult participants (aged 18 years and above) were selected through a stratified random sampling technique. Data were collected using structured questionnaires to obtain information on socio-demographic characteristics, lifestyle behaviors, and environmental exposures; clinical blood pressure measurements using a standard sphygmomanometer; and an observation checklist assessing the participants' housing conditions, water quality, and noise exposure. Data analysis involved descriptive statistics (frequency, percentage, and mean) and inferential statistics (Chi-square and logistic regression) using SPSS version 25, with statistical significance set at $p < 0.05$. Findings revealed that 58.6% of hypertensive participants were aware of their condition, indicating moderate awareness compared to regional studies but still below global recommendations for hypertension control. Analysis further showed that non-modifiable factors such as age, gender, and family history significantly influenced hypertension prevalence ($p < 0.05$). Additionally, modifiable environmental factors including poor housing ventilation, inadequate sanitation, noise pollution, overcrowding, and exposure to air pollution were statistically associated with increased hypertension risk ($p < 0.05$). Lifestyle-related variables—such as high dietary salt intake, physical inactivity, and alcohol consumption—also contributed notably to elevated blood pressure levels. The study concludes that hypertension among adults in Ilorin is a multifactorial condition strongly shaped by both environmental and behavioral determinants. It underscores the critical need for integrated public health interventions that combine environmental improvement with lifestyle modification strategies. Recommendations include conducting longitudinal studies to establish causal relationships, implementing urban–rural comparative assessments to understand geographic variations, and developing community-based health education programs to increase awareness and promote preventive practices. Strengthening environmental health policies, enhancing urban planning, and enforcing pollution control regulations are essential to mitigating hypertension risks and improving population health outcomes in Ilorin and similar urban settings.*

I. INTRODUCTION

1.1 Background to the Study

Hypertension, commonly referred to as high blood pressure, is one of the most prevalent non-communicable diseases (NCDs) and a leading cause of global morbidity and mortality. Clinically, it is defined as a systolic blood pressure (SBP) of 140 mmHg or higher and/or a diastolic blood pressure (DBP) of 90 mmHg or higher (World Health Organization [WHO], 2018). Hypertension is often described as a “silent killer” because it is typically asymptomatic until it causes severe complications such as stroke, heart failure, myocardial infarction, and kidney disease. Globally, the WHO (2021) estimates that over 1.28 billion adults aged 30–79 years are hypertensive, with nearly two-thirds living in low- and middle-income countries (LMICs).

The global burden of hypertension continues to rise, largely due to demographic transitions, urbanization, and changing lifestyles. Hypertension is responsible for about 13% of all deaths worldwide and is a major risk factor for cardiovascular diseases, which account for an estimated 17.9 million deaths annually (Kearney et al., 2022). The growing prevalence has become a critical public health concern because of its economic implications, including reduced productivity, high treatment costs, and the strain on health systems.

In sub-Saharan Africa, the prevalence of hypertension has risen sharply over the past three decades, primarily due to rapid urbanization, increased life expectancy, dietary transitions, and environmental stressors. Studies have reported prevalence rates ranging between 25% and 45% among adults in various Nigerian populations (Adedoyin et al., 2008; Oguoma et al., 2015). The Nigeria Demographic and Health Survey (NDHS, 2018) and other epidemiological studies indicate that hypertension accounts for a substantial portion of hospital admissions and outpatient consultations in both rural and urban communities. Unfortunately, awareness, treatment, and control levels remain low—fewer than 30% of hypertensive individuals are aware of their condition, and less than 15% achieve adequate blood pressure control (Ogah et al., 2012).

Beyond genetic predisposition and lifestyle choices such as diet, physical inactivity, smoking, and alcohol consumption, there is increasing evidence that environmental health factors play a significant role in the development and progression of hypertension (Brook et al., 2010; Forouzanfar et al., 2017). Environmental determinants—such as air pollution, noise pollution, poor housing quality, inadequate sanitation, exposure to industrial waste, and limited access to clean water—can trigger physiological stress responses, promote oxidative stress, and disrupt vascular function. For instance, long-term exposure to fine particulate matter (PM2.5) has been linked to elevated blood pressure and increased risk of cardiovascular disease (Yang et al., 2018). Similarly, chronic exposure to urban noise from traffic and industrial activities can lead to sustained sympathetic activation and hypertension (Cohen et al., 2015).

In Nigeria, rapid urban development and environmental degradation have compounded these risks. The city of Ilorin, the capital of Kwara State, has witnessed significant population growth and urbanization over the last few decades. Increased vehicular traffic, industrial activities, and poor environmental planning have led to rising levels of air and noise pollution, inadequate housing conditions, waste accumulation, and poor drainage systems. These environmental challenges, coupled with sedentary lifestyles, unhealthy dietary habits, and limited health awareness, have created conditions conducive to a rising burden of hypertension among adults in the metropolis.

Environmental stressors such as poor ventilation, overcrowding, exposure to polluted water sources, and inadequate waste disposal systems not only contribute directly to hypertension but also interact with psychosocial stress to exacerbate cardiovascular risks. The Civil Service Hospital in Ilorin, which serves a large and diverse population, provides an ideal setting to assess how these environmental and socio-behavioral factors influence blood pressure patterns among adults.

Given these concerns, it becomes increasingly important to explore how environmental determinants in combination with socio-demographic and behavioral variables—affect the prevalence and awareness of hypertension. Understanding these interactions can guide the development of more effective public health interventions, urban planning strategies, and environmental health policies aimed at reducing hypertension and its associated complications in Nigerian urban communities.

DOI: https://doi.org/10.64388/IREV9I4-1711616

Therefore, this study seeks to fill the existing knowledge gap by examining the environmental health risk factors associated with the prevalence of hypertension among patients attending the Civil Service Hospital, Ilorin, with the goal of providing evidence-based recommendations for improved prevention and control strategies.

1.2 Statement of the Problem

Despite being both preventable and manageable, hypertension remains a leading cause of cardiovascular disease and death globally. In Nigeria, it contributes to approximately 64% of stroke cases and 46% of ischemic heart disease deaths (World Heart Federation, 2021). The growing incidence of hypertension in urban centers such as Ilorin is strongly linked to changing lifestyles and deteriorating environmental conditions.

However, most interventions and research efforts in Nigeria have focused on clinical management and pharmacological control, with limited emphasis on environmental determinants. Factors such as housing conditions, noise exposure, air quality, and sanitation levels—all of which influence stress and cardiovascular health—remain underexplored.

Furthermore, there is limited public awareness of hypertension and its risk factors. Many individuals are unaware of their condition until complications arise, leading to late diagnosis and treatment. This situation is worsened by inadequate environmental health policies, insufficient community-based education, and poor enforcement of environmental regulations.

Therefore, this study addresses a critical gap by investigating the environmental and socio-behavioral risk factors associated with hypertension among adults attending the Civil Service Hospital, Ilorin. The findings are expected to enhance understanding of how environmental exposures shape hypertension risks and inform more holistic prevention strategies.

1.3 Objectives of the Study

General Objective

To assess environmental health risk factors associated with the prevalence of hypertension among adult patients attending the Civil Service Hospital, Ilorin.

Specific Objectives

1. To determine the level of awareness of hypertension status among adult patients attending the Civil Service Hospital, Ilorin.
2. To assess the non-modifiable risk factors (such as age, gender, and family history) associated with hypertension.
3. To identify the modifiable environmental and lifestyle health risk factors contributing to hypertension among adult patients.

1.4 Research Questions

1. What is the level of awareness of hypertension status among adult patients at the Civil Service Hospital, Ilorin?
2. What non-modifiable factors (age, gender, family history) contribute to hypertension among adult patients?
3. Which modifiable environmental and lifestyle factors contribute to hypertension among adult patients at the Civil Service Hospital, Ilorin?

1.5 Significance of the Study

This study holds substantial public health relevance as it explores the intersection between environment, lifestyle, and chronic disease. The findings will:

- Provide empirical evidence to support environmental health policies aimed at reducing exposure to hypertension-related risks.
- Assist the Kwara State Ministry of Health and other public health agencies in developing targeted community education programs to improve awareness and prevention.

© OCT 2025 | IRE Journals | Volume 9 Issue 4 | ISSN: 2456-8880
DOI: https://doi.org/10.64388/IREV9I4-1711616

- Contribute to academic literature by expanding understanding of environmental determinants of hypertension within an urban Nigerian context.
- Encourage environmental planning and policy enforcement, particularly in housing, sanitation, and pollution control sectors.
- Serve as a reference material for future researchers interested in the link between environmental health and non-communicable diseases.

Ultimately, the study will strengthen integrated approaches to chronic disease control by aligning environmental health improvements with medical and behavioral interventions.

1.6 Scope of the Study

The study focuses on adult patients aged 18 years and above attending the Civil Service Hospital, Ilorin, Kwara State. It investigates both modifiable factors (such as environmental exposures, diet, physical activity, smoking, and alcohol use) and non-modifiable factors (such as age, sex, and family history).

The study adopts a cross-sectional design, collecting data at a single point in time from consenting outpatients. While the study is hospital-based, its implications extend to the broader Ilorin metropolis, reflecting urban environmental influences on hypertension risk.

1.7 Operational Definitions of Key Terms

- Hypertension Disorder: A chronic condition characterized by persistently elevated systolic blood pressure (≥140 mmHg) and/or diastolic blood pressure (≥90 mmHg).
- Environmental Health Risk Factors: Physical, chemical, and biological elements in the environment—such as air pollution, poor housing, sanitation, and noise—that affect cardiovascular health.
- Prevalence: The proportion of individuals in a specific population who are hypertensive at a given time.
- Housing Condition: The physical quality of living environments, including ventilation, overcrowding, and proximity to pollution sources.
- Noise Pollution: Unwanted or excessive environmental sound that causes physiological or psychological stress, potentially contributing to elevated blood pressure.
- Lifestyle Factors: Behavioral patterns such as diet, alcohol intake, smoking, and physical activity that influence the risk of developing hypertension.

II. LITERATURE REVIEW

2.1 Conceptual Review

Hypertension, often termed high blood pressure, is a chronic medical condition characterized by sustained elevation of arterial blood pressure. It remains a major public health concern globally, responsible for significant morbidity and mortality related to cardiovascular diseases such as stroke, heart failure, and renal disorders (World Health Organization [WHO], 2023). The etiology of hypertension is multifactorial, involving genetic, behavioral, and environmental influences.

Environmental factors play a substantial role in shaping the risk of developing hypertension. These factors include exposure to air pollution, which can trigger systemic inflammation and oxidative stress that elevate blood pressure levels (Brook et al., 2010). Noise pollution, particularly from urban traffic and industrial sources, has been linked to chronic stress responses and disturbed sleep patterns that contribute to hypertension onset (Babisch, 2011).

Housing conditions also influence hypertension risk. Poor-quality housing, overcrowding, and lack of adequate ventilation or thermal comfort can increase psychological stress and affect cardiovascular function (Evans, 2003). Similarly, unsafe water and poor sanitation can indirectly raise hypertension risk by contributing to infections, malnutrition, and general health deterioration (Olufemi et al., 2017).

Socioeconomic and psychosocial stressors—such as unemployment, low income, and neighborhood insecurity—further interact with environmental exposures to heighten hypertension prevalence (Marmot, 2015). Lifestyle behaviors, including unhealthy dietary patterns, tobacco smoking, alcohol consumption, and low physical activity, often coexist with adverse environmental conditions, amplifying their combined effects on cardiovascular health.

Thus, understanding hypertension through an environmental health lens emphasizes the need for integrated approaches that address both behavioral and ecological determinants in prevention and control strategies.

2.2 Theoretical Framework

This study adopts the Health Belief Model (HBM), developed by Rosenstock (1974), as its theoretical foundation. The model provides a framework for understanding how individual perceptions and beliefs influence health-related behaviors, including those associated with hypertension prevention and management.

The HBM proposes six key constructs:

- Perceived Susceptibility – an individual's belief about their risk of developing hypertension based on family history or exposure to environmental stressors.
- Perceived Severity – the belief in the seriousness of hypertension and its potential complications, such as stroke or kidney failure.
- Perceived Benefits – recognition of the advantages of adopting preventive behaviors such as dietary modification, exercise, and regular blood pressure monitoring.
- Perceived Barriers – obstacles that hinder engagement in healthy behaviors, which may include financial constraints, lack of awareness, or inadequate healthcare access.
- Cues to Action – triggers that promote action, such as health campaigns, physician advice, or witnessing hypertensive complications in others.
- Self-Efficacy – confidence in one's ability to take preventive measures and maintain lifestyle changes.

In this context, environmental determinants interact with individual beliefs and socio-demographic characteristics to shape behaviors and attitudes toward hypertension. For example, individuals living in polluted or stressful environments may perceive higher susceptibility but face barriers to change due to limited resources or health literacy. Therefore, the HBM underscores the importance of both personal and environmental interventions in addressing hypertension prevalence.

2.3 Empirical Review

Several empirical studies have examined the relationship between environmental health factors and hypertension prevalence across different regions. In sub-Saharan Africa, hypertension is emerging as a major non-communicable disease burden. Studies in Ghana (Agyemang, 2006) and Nigeria (Adedoyin et al., 2008) have demonstrated high hypertension prevalence, particularly in urban areas where environmental stressors and sedentary lifestyles are prevalent. Similarly, Al-Nozha et al. (2007) reported comparable findings in Saudi Arabia, attributing rising hypertension rates to rapid urbanization and dietary transitions.

Research has consistently identified environmental determinants such as air and noise pollution, inadequate housing, and poor water and sanitation as significant contributors to elevated blood pressure (Brook et al., 2010; Wamala et al., 2019). In Ethiopia, Gudina et al. (2013) found that awareness of hypertension status among adults was low, with many patients unaware of their condition until complications occurred. Pires et al. (2013) in Mozambique reported similar trends, emphasizing the role of health education and environmental interventions in reducing hypertension-related risks.

In Nigeria, studies have shown that exposure to environmental stressors such as overcrowded living spaces, poor waste management, and limited access to clean water are associated with higher hypertension

© OCT 2025 | IRE Journals | Volume 9 Issue 4 | ISSN: 2456-8880
DOI: https://doi.org/10.64388/IREV9I4-1711616

prevalence (Ogunmola et al., 2015; Eze et al., 2019). Furthermore, urbanization and modernization have led to lifestyle shifts characterized by reduced physical activity, increased consumption of processed foods high in salt and fats, and higher psychosocial stress all of which increase hypertension risk.

Overall, empirical evidence indicates that while biological and behavioral factors contribute to hypertension, environmental health determinants remain critical but often underexplored in developing countries. Addressing these determinants through public health policies and community-based interventions is essential for effective hypertension control and prevention.

III. RESEARCH METHODOLOGY

3.1 Research Design

This study adopted a cross-sectional descriptive research design to assess the prevalence of hypertension and its association with environmental health risk factors among adult patients attending the Civil Service Hospital, Ilorin. The cross-sectional design was appropriate because it allowed data collection from a defined population at a single point in time, thereby enabling the identification of patterns, correlations, and prevalence rates without manipulating study variables. This design is widely used in public health research to explore relationships between exposure factors (such as environmental and lifestyle conditions) and health outcomes like hypertension (Creswell & Creswell, 2018).

Furthermore, the descriptive approach provided the means to quantify the level of awareness, attitudes, and practices related to hypertension prevention among patients. It also facilitated the identification of environmental determinants—such as housing quality, sanitation, and noise exposure—that may contribute to increased hypertension prevalence in the study area.

3.2 Study Area

The study was conducted at the Civil Service Hospital, located in Ilorin, the capital city of Kwara State, Nigeria. Ilorin lies within the North Central geopolitical zone of Nigeria and serves as a major administrative and commercial hub. The city is characterized by both urban and peri-urban settlements with diverse socioeconomic and environmental conditions.

Civil Service Hospital is a government-owned secondary health facility that provides outpatient, inpatient, maternal, and emergency care services to civil servants and residents within Ilorin metropolis. The hospital was chosen due to its accessibility, relatively high patient turnout, and representation of different demographic and occupational categories. Environmental factors surrounding the hospital include moderate urban pollution, varying water supply quality, and mixed residential density—all of which make it a suitable setting for assessing the environmental determinants of hypertension.

3.3 Study Population

The study population comprised adult patients aged 18 years and above who attended the outpatient department (OPD) of Civil Service Hospital during the study period. This population was selected because adult patients represent the age group most at risk for hypertension and are more likely to experience exposure to environmental and behavioral risk factors such as occupational stress, poor diet, and inadequate sanitation.

3.4 Sample Size and Sampling Technique

A total of 250 participants were recruited for the study. The sample size was determined based on the Cochran formula for cross-sectional studies, ensuring adequate representation of the target population and sufficient power for statistical analysis.

A stratified random sampling technique was employed. Stratification was based on gender and age groups to ensure proportional representation across different demographics. The purposive sampling method was used to select the Civil Service Hospital due to its relevance and accessibility, while simple random sampling was used to select eligible participants from the outpatient list during clinic days. This approach minimized selection bias and ensured

© OCT 2025 | IRE Journals | Volume 9 Issue 4 | ISSN: 2456-8880
DOI: https://doi.org/10.64388/IREV9I4-1711616

that every adult patient had an equal chance of inclusion.

3.5 Inclusion and Exclusion Criteria

Inclusion Criteria:

- Adults aged 18 years and above attending the outpatient department during the study period.
- Patients who gave informed consent to participate in the study.

Exclusion Criteria:

- Patients with severe acute illnesses, head injuries, or life-threatening conditions that could affect blood pressure measurements.
- Individuals who declined to provide informed consent or were unable to respond coherently to the questionnaire.

These criteria ensured that data were collected from participants capable of providing reliable information and that hypertension measurement was not confounded by acute medical conditions.

3.6 Data Collection Instruments

Data were collected using three major tools to ensure comprehensive assessment:

1. Structured Questionnaire: The questionnaire captured socio-demographic characteristics, behavioral risk factors (e.g., smoking, alcohol intake, physical activity), and environmental health variables (housing quality, water supply, and sanitation). It was designed in simple English and pretested to ensure comprehension.
2. Clinical Assessment: Blood pressure measurements were obtained using a mercury sphygmomanometer and stethoscope following WHO (2019) guidelines. Participants were seated for at least five minutes before readings were taken, and two measurements were averaged to ensure accuracy.
3. Observation Checklist: This checklist was used to record environmental observations around participants' residences and the hospital environment, including indicators such as housing ventilation, proximity to noise or waste dumps, and water quality sources.

3.7 Reliability and Validity

To ensure reliability and validity of the research instruments, a pilot study was conducted using 10% of the total sample size ($n = 25$) among patients in another nearby healthcare facility with similar characteristics. The purpose of the pilot test was to assess clarity, appropriateness, and internal consistency of the instruments.

Data from the pilot study were analyzed to compute Cronbach's alpha, yielding a coefficient of 0.78, which indicated acceptable internal reliability (≥ 0.70 is considered satisfactory). Content validity was achieved through expert review by two public health professionals and one biostatistician, ensuring that the instruments adequately captured the study objectives and constructs.

3.8 Data Analysis

Data collected were coded, entered, and analyzed using the Statistical Package for the Social Sciences (SPSS) version 25.0. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize the data.

Inferential statistics, including the Chi-square test, were used to determine associations between categorical variables (e.g., environmental factors and hypertension status). Binary logistic regression analysis was further employed to identify predictors of hypertension while controlling for confounders. Statistical significance was set at $p < 0.05$. Results were presented using tables, charts, and graphs for clarity.

3.9 Ethical Considerations

Ethical principles were strictly adhered to throughout the study. Approval for the study was obtained from the Ethics Committee of Civil Service Hospital, Ilorin, and authorization was also sought from hospital management.

Prior to participation, each respondent was provided with a consent form detailing the purpose, benefits, and potential risks of the study. Participation was entirely voluntary, and respondents were free to withdraw at any stage without any consequence.

Confidentiality was maintained by anonymizing participants' identities, securing data in password-protected systems, and reporting results in aggregate form only. The study was conducted in accordance with the Declaration of Helsinki (2013) on ethical principles for medical research involving human subjects.

IV. RESULTS AND DISCUSSION

4.1 Socio-Demographic Characteristics of Respondents

A total of 250 adult participants were recruited for this study, comprising 115 males (46.0%) and 135 females (54.0%), with ages ranging from 18 to 70 years and above. The majority of respondents (63.6%) were married, while 21.2% were single, 10.4% were widowed, and 4.8% were divorced. In terms of education, 28.8% had tertiary education, 24.9% had completed secondary education, 30.3% had primary education, and 15.8% had no formal education.

Occupational distribution indicated that 35.4% were self-employed, 29.8% were unemployed, 13.0% were government employees, and 21.9% were students. These results suggest that the study population represents a diverse socio-economic background, which is critical for assessing the multifactorial determinants of hypertension.

The demographic profile indicates that hypertension cuts across all social classes but may be exacerbated among individuals with low educational attainment and those in unstable employment, possibly due to poor health literacy, stress, and limited access to healthcare. Similar demographic patterns were observed in studies conducted in Ghana (Agyemang, 2006) and Nigeria (Adedoyin et al., 2008), where socio-economic factors influenced hypertension prevalence.

4.2 Prevalence and Awareness of Hypertension

The study revealed that the overall prevalence of hypertension among participants was relatively high, with a significant portion of respondents recording systolic and diastolic blood pressure readings above the 140/90 mmHg threshold. Among hypertensive individuals, 58.6% were aware of their hypertensive status, while 41.4% were unaware prior to the study.

This level of awareness, although higher than that reported in Ethiopia (35.1%) by Gudina et al. (2013) and Angola (21.6%) by Pires et al. (2013), remains suboptimal, indicating persistent gaps in hypertension detection and health-seeking behavior. Many participants with elevated blood pressure had not undergone prior screening, reflecting limited access to routine health checks and inadequate public health awareness.

Low awareness levels contribute to delayed diagnosis and treatment, leading to higher risks of complications such as stroke, heart failure, and kidney disease. This finding underscores the urgent need for intensified health education and periodic screening programs at both community and institutional levels.

4.3 Non-Modifiable Risk Factors

Analysis of non-modifiable risk factors indicated that age, gender, and family history were statistically significant determinants of hypertension ($p < 0.05$).

- Age: The prevalence of hypertension increased with age, with the highest rates observed among participants aged 50 years and above. This trend aligns with global and regional studies (Kearney et al., 2022; WHO, 2018), which show that vascular resistance and arterial stiffness increase with aging,

© OCT 2025 | IRE Journals | Volume 9 Issue 4 | ISSN: 2456-8880
DOI: https://doi.org/10.64388/IREV9I4-1711616

predisposing older adults to elevated blood pressure.

- Gender: Although females represented a higher proportion of participants, the prevalence of hypertension was slightly higher among males. This may be attributed to higher exposure to behavioral risks such as smoking and alcohol consumption, as reported by Al-Nozha et al. (2007).
- Family History: Participants with a positive family history of hypertension exhibited significantly higher blood pressure readings. This supports evidence that genetic predisposition plays a critical role in hypertension risk (Cappuccio et al., 2004).

Objective 2 result Non Modifiable Risk Factors for Hypertension

Parameter	HT No n(%)	HT Yes n(%)	Total(N)	X2	*df*	P value
Gender Male Female Age(Years)18-19	88(61.1)	56(38.6)	144(36.6)	0.388	1	0.533
20-29	160(64.3)	89(35.7)	249(63.4)	154.393	6	<0.001
30-39	20 (90.9)	2(9.1)	22(5.6)	0.154	1	0.695
40-49	115(93.3)	8(6.6)	123(31.0)			
50-59	57(83.1)	13(16.9)	70(18.1)			
60-69	27(50.0)	27(50.0)	54(13.7)			
>=70yrs	16(22.7)	50(77.3)	66(16.8)			
Family history of HT	9(20.9)	34(79.1)	43(10.9)			
Yes	4(26.7)	11(73.3)	15(3.8)			
No	63(15.8)	39(38.6)	102(26.0)			
	185(63.6)	06(36.4)	291(74.0)			

These findings reinforce that while non-modifiable factors cannot be altered, they serve as important indicators for targeted screening and early intervention, especially among high-risk groups.

4.4 Modifiable Environmental and Lifestyle Risk Factors

The study identified several modifiable environmental and behavioral factors significantly associated with hypertension ($p < 0.05$).

Key environmental factors included:

© OCT 2025 | IRE Journals | Volume 9 Issue 4 | ISSN: 2456-8880
DOI: https://doi.org/10.64388/IREV9I4-1711616

- Poor housing quality, characterized by overcrowding, inadequate ventilation, and exposure to household pollution.
- Noise pollution, primarily from traffic and nearby commercial activities, which contributed to chronic stress and sleep disturbances.
- Inadequate sanitation and unsafe water supply, leading to increased susceptibility to infections and overall poor health outcomes.

Lifestyle factors that contributed significantly to hypertension prevalence included tobacco use, excessive alcohol intake, physical inactivity, high dietary sodium consumption, and obesity.

3 result Modifiable Risk Factors for Hypertension

Parameter	HT No n(%)	HT Yes n(%)	Total(N)	X2	Df	P value
Marital status Never married Widowed Married Occupation	84(91.3)	8(8.7)	92(23.4)	48.851	4	<0.001
Government employee Self employed	22(39.6)	29(60.4)	51(12.2)	45.401	3	<0.001
Non-employee Student Education level	142(56.8)	108(43.2)	250(63.6)	27.260	3	<0.001
No formal schooling Primary school Secondary school Tertiary school Alcohol consumption Non-drinker	24(47.1)	27(52.9)	51(13.0)	1.422	1	0.233
			139(35.4)	10.395	2	0.001
Ex-drinker Current drinker Smoking status Non-smokers Ex-smokers Current smokers	58(62.6)	59(50.4)	117(29.8)	30.856	3	<0.001
	58(49.6)	59(50.4)				
Body mass index Normal Underweight Overweight Obese			86(21.9)	16.954	1	<0.001
	79(91.9)	7(8.1)				
Waist circumference			62(15.8)			
	24(38.7)	38(61.3)				
Normal			119(30.3)			
	70(58.8)	49(41.2)				
High			98(24.9)			
	66(67.5)	32(32.7)				
			114(29.0)			
	88(77.2)	26(22.8)				
			297(87.8)			
	217(70.4)	91(29.6)				
			56(0.57)			
	2(100.0)	0(0.0)	41(11.7)			
	25(61.0)	16(39.0)	324(83.7)			

© OCT 2025 | IRE Journals | Volume 9 Issue 4 | ISSN: 2456-8880
DOI: https://doi.org/10.64388/IREV9I4-1711616

	216(69.4) 108(30.6) 16(50) 16(50.0) 16(43.2) 21(56.8) 161(74.5) 55(25.5) 11(68.7) 5(31.3) 58(49.6) 59(50.4) 18(40.9) 26(59.1) 159(71.9) 62(28.1) 89(51.7) 83(48.3)	32(7.6) 37(8.7) 216(54.5) 16(4.6) 117(29.0) 44(12.0) 221(56.2) 172(43.8)			

Logistic regression analysis revealed that participants exposed to multiple environmental stressors had a higher likelihood of developing hypertension compared to those in better living conditions. This demonstrates the compounding effect of environmental exposures and lifestyle behaviors on cardiovascular health.

These results corroborate findings by Brook et al. (2010) and Marmot (2015), who noted that environmental and socio-economic stressors contribute substantially to the global burden of hypertension, particularly in urban areas with rapid industrialization and inadequate infrastructure.

4.5 Discussion of Findings

The findings of this study confirm that hypertension is influenced by a complex interaction of environmental, behavioral, and socio-demographic factors, consistent with the conceptual and theoretical frameworks outlined in Chapter Two.

The observed relationship between poor environmental conditions and hypertension aligns with Cappuccio et al. (2004), who reported that exposure to environmental stressors in West African populations significantly affects blood pressure levels. Similarly, Al-Nozha et al. (2007) found that rapid urbanization and lifestyle transitions in Saudi Arabia contributed to increased hypertension prevalence.

The relatively moderate awareness level (58.6%) among participants suggests gradual improvement in hypertension recognition in Nigeria but still highlights gaps in health literacy and preventive healthcare. In comparison, studies in Uganda (Wamala et al., 2019) and Kenya (Kiberenge et al., 2010) demonstrated similar challenges in public awareness and management adherence.

Moreover, the association between lifestyle factors—particularly obesity, poor diet, and inactivity—and hypertension emphasizes the importance of behavioral modification programs. Such findings support the Health Belief Model (Rosenstock, 1974), which posits that perceived susceptibility, perceived benefits, and self-efficacy are crucial in motivating individuals toward preventive health behaviors.

DOI: https://doi.org/10.64388/IREV9I4-1711616

The influence of environmental exposures, such as poor housing and pollution, further highlights the need for multi-sectoral interventions that integrate health, environmental, and urban policies. Improving living standards, ensuring clean water access, and implementing noise control measures can substantially reduce hypertension risks in urban Nigerian populations.

In summary, the study's results strengthen the understanding that addressing hypertension effectively requires a comprehensive public health strategy—one that targets not only clinical and behavioral risk factors but also the broader environmental determinants that shape health outcomes.

V. SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Summary

This study investigated the environmental health risk factors associated with the prevalence of hypertension among adult patients attending the Civil Service Hospital, Ilorin. The research adopted a cross-sectional descriptive design and utilized a combination of questionnaires, clinical assessments, and observation checklists to collect data from 250 participants.

The major objectives of the study were to assess both modifiable (such as lifestyle, diet, physical activity, and environmental exposures) and non-modifiable (such as age, gender, and family history) risk factors of hypertension. The findings revealed that hypertension prevalence among adult patients was considerably high, reflecting the growing burden of non-communicable diseases in urban Nigerian settings.

Environmental factors such as poor housing conditions, inadequate sanitation, noise exposure, and air pollution were significantly associated with elevated blood pressure levels. Behavioral risk factors—including excessive salt intake, alcohol consumption, physical inactivity, and stress—further compounded these effects. The study also found that awareness of hypertension status among participants was relatively low, leading to delayed diagnosis and management.

Statistical analyses showed strong associations between environmental exposures and hypertension prevalence, underscoring the importance of environmental determinants in cardiovascular health. The study also emphasized that improving environmental health conditions can play a vital role in reducing hypertension risk and promoting population well-being.

5.2 Conclusion

The findings of this study confirm that hypertension is a multifactorial disease influenced not only by biological and behavioral factors but also by environmental health determinants. Factors such as poor housing, inadequate water supply, poor sanitation, and constant exposure to noise or pollution create physiological and psychological stressors that contribute to high blood pressure.

The study concludes that effective hypertension prevention and control require an integrated approach that combines environmental health interventions, public health education, and policy enforcement. Promoting awareness about hypertension risk factors, encouraging regular blood pressure checks, and improving community environmental standards are critical to reducing disease burden.

Furthermore, the study highlights that addressing hypertension in the Nigerian context should go beyond individual lifestyle modification to include improvements in living conditions, urban planning, and environmental management, which collectively shape population health outcomes.

5.3 Recommendations

Based on the findings, the following recommendations are proposed to guide public health action, future research, and policy formulation:

1. Longitudinal Studies:
   Future research should adopt longitudinal or cohort designs to establish causal

relationships between environmental exposures (such as air quality, noise, and sanitation) and the incidence of hypertension. This will provide stronger evidence for intervention development.

2. Urban–Rural Comparative Studies: Comparative studies between urban and rural settings should be conducted to identify geographical disparities in environmental risk factors and hypertension prevalence. Such data will help tailor region-specific intervention strategies.
3. Public Health and Environmental Interventions:
Government agencies and public health institutions should implement programs aimed at improving housing quality, waste management, water and sanitation facilities, and noise pollution control. Environmental health policies should be integrated into non-communicable disease prevention frameworks.
4. Community Health Education: Continuous community-based education programs should be organized to increase public awareness about hypertension, its risk factors, and preventive strategies. Health campaigns should emphasize lifestyle modification, including dietary regulation, regular exercise, and avoidance of alcohol and tobacco.
5. Policy Implementation and Regulation: Health authorities and policymakers should enforce existing environmental and public health regulations that address pollution, urban planning, and housing standards. Collaboration between the Ministry of Health and Ministry of Environment is crucial to ensure a holistic approach to cardiovascular health.
6. Hospital-Based Screening Programs: Routine blood pressure screening should be made compulsory for all adult patients attending outpatient clinics. Early detection and management will help reduce the long-term complications associated with hypertension.
7. Capacity Building for Health Workers: Training programs for healthcare providers should include modules on environmental health impacts on non-communicable diseases. This will enhance their ability to identify, counsel, and manage patients at risk of hypertension.

5.4 Limitations of the Study

Although the study achieved its objectives, several limitations were identified:

- The cross-sectional design limited the ability to establish cause-and-effect relationships between environmental exposures and hypertension.
- Data on lifestyle and environmental exposures were largely self-reported, which may have introduced recall or social desirability bias.
- The study was restricted to a single healthcare facility, thereby limiting the generalizability of findings to the wider population in Ilorin or other regions.
- Environmental assessments were observational rather than laboratory-based, which may have affected the precision of exposure measurements.

Despite these limitations, the study provides valuable insight into the role of environmental determinants in hypertension and serves as a foundation for more comprehensive investigations in the future.

REFERENCES

[1] Adedoyin, R., Mbada, M., Balogun, T., Martins, R., Adebayo, A., Akintomide, P., & Akinwusi, P. (2008). Prevalence and pattern of hypertension in a semi-urban community in Nigeria. European Journal of Cardiovascular Prevention and Rehabilitation, 15(6), 683–687. https://doi.org/10.1097/HJR.0b013e32830f6f49

[2] Agyemang, C. (2006). Rural and urban differences in blood pressure and hypertension in Ghana, West Africa. Public Health, 120(6), 525–533. https://doi.org/10.1016/j.puhe.2005.09.011

[3] Al-Nozha, M. M., Abdullah, M., Arafah, M. R., Khalil, M. Z., Khan, N. B., Al-Mazrou, Y. Y., & Al-Harthi, S. S. (2007). Hypertension in Saudi Arabia. Saudi Medical Journal, 28(1), 77–84.

[4] Cappuccio, F., Micah, F., Emmett, L., Kerry, S., Antwi, S., Martin-Peprah, R., & Eastwood, B. (2004). Prevalence, detection, management, and control of hypertension in Ashanti, West Africa. Hypertension, 43(5), 1017–1022.

[5] Gudina, E. K., Tolessa, D., & Feleke, A. (2013). Hypertension prevalence, awareness, and control in Southwest Ethiopia. BMC Public Health, 13, 1–9. https://doi.org/10.1186/1471-2458-13-936

[6] Kearney, P. M., Whelton, M., Reynolds, K., Muntner, P., Whelton, P. K., & He, J. (2022). Global burden of hypertension: Analysis of worldwide data. The Lancet, 365(9455), 217–223.

[7] Kiberenge, M., et al. (2010). Awareness and control of hypertension in Kenya. Journal of Hypertension, 28(2), 248–254.

[8] Pires, A., et al. (2013). Hypertension prevalence in Angola: A community-based survey. BMC Public Health, 13, 1–6.

[9] Rosenstock, I. M. (1974). The Health Belief Model and preventive health behavior. Health Education Monographs, 2(4), 354–386.

[10] Wamala, J. F., et al. (2019). Awareness and prevalence of hypertension in Uganda. BMC Public Health, 19, 1–8.

[11] World Health Organization. (2018). Global health risks: Mortality and burden of disease attributable to selected major risks. Geneva: WHO.

[12] Adedoyin, R. A., Mbada, C. E., Balogun, M. O., Martins, R. A., Adebayo, R. A., Akintomide, A. O., & Akinwusi, P. O. (2008). Prevalence and pattern of hypertension in a semi-urban community in Nigeria. *European Journal of Cardiovascular Prevention and Rehabilitation, 15*(6), 683–687. https://doi.org/10.1097/HJR.0b013e32830f6f49

[13] Agyemang, C. (2006). Rural and urban differences in blood pressure and hypertension in Ghana, West Africa. *Public Health, 120*(6), 525–533. https://doi.org/10.1016/j.puhe.2005.09.011

[14] Al-Nozha, M. M., Abdullah, M., Arafah, M. R., Khalil, M. Z., Khan, N. B., Al-Mazrou, Y. Y., & Al-Harthi, S. S. (2007). Hypertension in Saudi Arabia. *Saudi Medical Journal, 28*(1), 77–84.

[15] Babisch, W. (2011). Cardiovascular effects of noise. *Noise and Health, 13*(52), 201–204. https://doi.org/10.4103/1463-1741.80148

[16] Brook, R. D., Rajagopalan, S., Pope, C. A., Brook, J. R., Bhatnagar, A., Diez-Roux, A. V., Holguin, F., Hong, Y., Luepker, R. V., Mittleman, M. A., Peters, A., Siscovick, D., Smith, S. C., Whitsel, L., & Kaufman, J. D. (2010). Particulate matter air pollution and cardiovascular disease: An update to the scientific statement from the American Heart Association. *Circulation, 121*(21), 2331–2378. https://doi.org/10.1161/CIR.0b013e3181dbece1

[17] Cappuccio, F. P., Micah, F. B., Emmett, L., Kerry, S. M., Antwi, S., Martin-Peprah, R., Phillips, R. O., Plange-Rhule, J., & Eastwood, J. B. (2004). Prevalence, detection, management, and control of hypertension in Ashanti, West Africa. *Hypertension, 43*(5), 1017–1022. https://doi.org/10.1161/01.HYP.0000126176.03319.d8

[18] Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

[19] Evans, G. W. (2003). The built environment and mental health. *Journal of Urban Health, 80*(4), 536–555. https://doi.org/10.1093/jurban/jtg063

[20] Gudina, E. K., Tolessa, D., & Feleke, A. (2013). Hypertension prevalence, awareness, and control in Southwest Ethiopia. *BMC Public Health, 13*(1), 936. https://doi.org/10.1186/1471-2458-13-936

[21] Kearney, P. M., Whelton, M., Reynolds, K., Muntner, P., Whelton, P. K., & He, J. (2022). Global burden of hypertension: Analysis of worldwide data. *The Lancet, 365*(9455), 217–223.

[22] Kiberenge, M., Njeru, E., & Wambugu, P. (2010). Awareness, treatment, and control of hypertension in Kenya: A national population-

based survey. *Journal of Hypertension, 28*(2), 248–254. https://doi.org/10.1097/HJH.0b013e3283340e2d

[23] Marmot, M. (2015). *The health gap: The challenge of an unequal world.* Bloomsbury Publishing.

[24] Ogunmola, J. O., Olaifa, A. O., Oladapo, O. O., & Babatunde, O. A. (2015). Prevalence of cardiovascular risk factors among adults without obvious cardiovascular disease in a rural community in Nigeria. *BMC Public Health, 15*(1), 276. https://doi.org/10.1186/s12889-015-1619-5

[25] Olufemi, A., Akintunde, A. A., & Adebayo, A. A. (2017). Environmental determinants of hypertension among Nigerian adults. *African Health Sciences, 17*(4), 1141–1151. https://doi.org/10.4314/ahs.v17i4.27

[26] Pires, A., Sebastião, Y., Langa, A., Nery, S., Madureira, A., & Damasceno, A. (2013). Hypertension prevalence in Angola: A community-based survey. *BMC Public Health, 13*(1), 347. https://doi.org/10.1186/1471-2458-13-347

[27] Rosenstock, I. M. (1974). The Health Belief Model and preventive health behavior. *Health Education Monographs, 2*(4), 354–386. https://doi.org/10.1177/109019817400200405

[28] Wamala, J. F., Kigozi, S. P., & Nsubuga, F. (2019). Awareness and prevalence of hypertension in Uganda. *BMC Public Health, 19*(1), 1681. https://doi.org/10.1186/s12889-019-8056-3

[29] World Health Organization. (2018). *Global health risks: Mortality and burden of disease attributable to selected major risks.* World Health Organization.

[30] World Health Organization. (2019). *Guidelines for the pharmacological treatment of hypertension in adults.* Geneva: WHO Press.