

Clinical Profile and Risk Factors Associated with Hypertension among Patients Attending a Tertiary Care Hospital: A Cross-Sectional Study

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Received: 01-09-2026 / Revised: 05-10-2026 / Accepted: 11-10-2026

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Conflict of interest: Nil

Abstract

Background: Hypertension is a major public health concern associated with cardiovascular, cerebrovascular and renal complications. Its occurrence is influenced by demographic, clinical and lifestyle-related factors.

Objective: To assess the clinical profile and identify factors associated with hypertension among patients attending a tertiary care hospital.

Methods: A hospital-based cross-sectional study was conducted among 300 adult patients. Demographic characteristics, medical history, lifestyle factors, anthropometric measurements and blood pressure readings were recorded. Associations between hypertension and selected risk factors were assessed statistically.

Results: Hypertension was identified in 126 (42.0%) participants. Higher age, overweight or obesity, family history of hypertension and physical inactivity were associated with hypertension. Increasing age, overweight or obesity and family history remained significantly associated in multivariable analysis.

Conclusion: Routine blood pressure screening and early identification of associated risk factors may improve hypertension prevention and management.

Keywords: Hypertension, blood pressure, risk factors, obesity, diabetes mellitus, cross-sectional study.

DOI: 10.25258/ijcpr.18.10.54

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Introduction

Hypertension is a major public health concern and an important contributor to cardiovascular disease, stroke and chronic kidney disease. Its frequently asymptomatic nature can delay diagnosis and treatment, increasing the risk of long-term complications. The World Health Organization recognizes hypertension as a leading modifiable risk factor for premature morbidity and mortality worldwide [1].

The burden of hypertension varies according to age, sex, socioeconomic circumstances and lifestyle practices. An Indian cross-sectional study conducted in urban Varanasi reported associations between hypertension and several demographic and clinical characteristics, highlighting the importance of context-specific risk assessment [2]. Nationally representative research has also demonstrated gaps in hypertension screening, awareness, treatment and control in India [3,4]. Evidence-based guidelines emphasize the importance of appropriate diagnosis, lifestyle modification and timely treatment to reduce hypertension-related complications [5].

Several modifiable factors, including excess body weight, physical inactivity, high dietary salt intake, tobacco use and alcohol consumption, may contribute to elevated blood pressure. Nonmodifiable factors, particularly increasing age and family history, also influence susceptibility. Identifying these characteristics during routine clinical assessment may help healthcare professionals recognize individuals who require closer monitoring and preventive counselling.

Hospital-based studies provide useful information about the clinical characteristics of patients seeking medical care and the distribution of associated risk factors. However, their findings should be interpreted in the context of the population studied and should not automatically be generalized to the wider community.

The present study was undertaken to assess the clinical profile and identify factors associated with hypertension among patients attending a tertiary care hospital.

Materials and Methods

A hospital-based cross-sectional observational study was conducted in the outpatient departments of a tertiary care hospital over a period of 12 months. A total of 300 adult patients aged 18 years or older were included. Participants underwent clinical assessment, standardized blood pressure measurement and evaluation of selected demographic, clinical and lifestyle characteristics.

Inclusion criteria

- Adults aged 18 years or older.
- Patients attending the selected outpatient departments during the study period.
- Individuals willing to participate and provide informed consent.
- Patients with and without a previous diagnosis of hypertension.

Exclusion criteria

- Pregnant women.
- Patients with an acute medical emergency requiring immediate intervention.
- Individuals with incomplete clinical or blood pressure records.
- Patients unable to provide reliable information because of severe illness or impaired communication.

Data collection

Demographic details, medical history, lifestyle factors, height, weight and blood pressure were

recorded using a structured questionnaire and standardized procedures. BMI was calculated from height and weight. Blood pressure was measured using a validated device after adequate rest, with repeat measurements according to the study protocol.

Hypertension was defined as systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg, or current use of prescribed antihypertensive medication. Newly elevated blood pressure in previously undiagnosed participants required confirmation on another day.

Statistical Analysis: Categorical variables were expressed as frequencies and percentages, while continuous variables were summarized as mean $\pm$ standard deviation.

Associations were assessed using the chi-square test, and multivariable logistic regression was used to identify independently associated factors. A p-value of less than 0.05 was considered statistically significant. Statistical analysis was performed using IBM SPSS Statistics version 26.0.

Results

A total of 300 adult patients were included in the analysis. The demographic characteristics, clinical profile and lifestyle factors were assessed in relation to hypertension status. Hypertension was identified in 126 participants (42.0%), while 174 (58.0%) did not meet the study definition.

Table 1: Sociodemographic Characteristics of Study Participants (N = 300)

Characteristic		Number	Percentage
Age group (years)	18–29	42	14%
	30–39	60	20%
	40–49	72	24%
	50–59	66	22%
	≥ 60	60	20%
Sex	Male	162	54%
	Female	138	46%
Residence	Urban	186	62%
	Rural	114	38%

Participants aged 40–49 years formed the largest age group (24%). Males constituted 54% of the study population, and 62% of participants resided in urban areas.

Table 2: Clinical Characteristics and Comorbidities among Participants (N = 300)

Clinical characteristic	Number	Percentage
Overweight or obesity (BMI ≥ 25 kg/m ²)	156	52%
Diabetes mellitus	66	22%
Family history of hypertension	90	30%
Previous diagnosis of hypertension	102	34%
Current antihypertensive medication use	96	32%

Overweight or obesity was the most frequent clinical characteristic, affecting 52% of participants. A family history of hypertension was reported by 30%, while 34% reported a previous diagnosis of hypertension

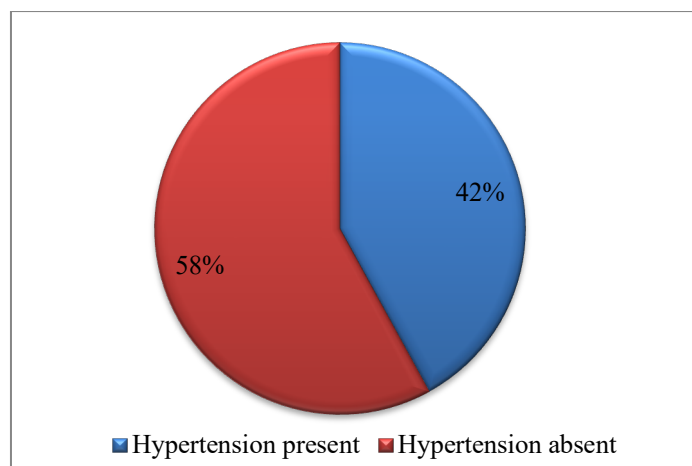


Figure 1: Distribution of Participants According to Hypertension Status

Hypertension was identified in 42% of the recruited hospital attendees, while 58% did not meet the study definition.

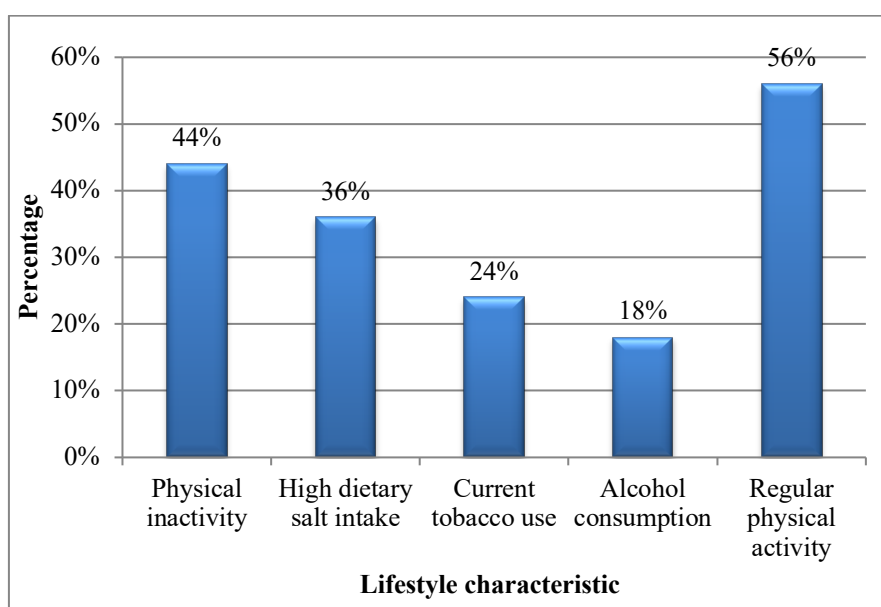


Figure 2: Distribution of Lifestyle-Related Characteristics among Study Participants (N = 300)

Physical inactivity was reported by 44% of participants, while 36% reported high dietary salt intake. Tobacco use and alcohol consumption were reported by 24% and 18%, respectively. Regular physical activity was reported by 56% of participants.

Table 3: Association between Selected Characteristics and Hypertension Status (N = 300)

Characteristic		Hypertension present, n/N (%)	Hypertension absent, n/N (%)	p-value
Age	18–39 years	24/102 (23.5%)	78/102 (76.5%)	<0.001
	≥40 years	102/198 (51.5%)	96/198 (48.5%)	
Sex	Male	72/162 (44.4%)	90/162 (55.6%)	0.35
	Female	54/138 (39.1%)	84/138 (60.9%)	
BMI	<25 kg/m ²	42/144 (29.2%)	102/144 (70.8%)	<0.001
	≥25 kg/m ²	84/156 (53.8%)	72/156 (46.2%)	
Family history of hypertension	Present	54/90 (60%)	36/90 (40%)	<0.001
	Absent	72/210 (34.3%)	138/210 (65.7%)	
Physical activity	Inactive	72/132 (54.5%)	60/132 (45.5%)	<0.001
	Active	54/168 (32.1%)	114/168 (67.9%)	

Hypertension was significantly more frequent among participants aged 40 years or older, those with BMI ≥ 25 kg/m², those reporting a family history of hypertension and those reporting physical inactivity. The association with sex was not statistically significant.

Table 4: Multivariable Logistic Regression Analysis of Factors Associated with Hypertension

Factor	Adjusted odds ratio (AOR)	95% confidence interval	p-value
Age ≥ 40 years	2.18	1.25–3.80	0.006
BMI ≥ 25 kg/m ²	2.05	1.22–3.45	0.007
Family history of hypertension	1.92	1.12–3.29	0.018
Physical inactivity	1.58	0.96–2.60	0.073
Male sex	1.14	0.70–1.86	0.60

Age ≥ 40 years, overweight or obesity and a family history of hypertension remained independently associated with hypertension in the adjusted model. Physical inactivity showed a positive association but did not reach statistical significance after adjustment. Male sex was not independently associated with hypertension.

Discussion

The present study assessed the clinical profile and factors associated with hypertension among patients attending a tertiary care hospital. Hypertension was identified in 42.0% of the recruited participants.

This proportion represents the hospital-based study population and should not be interpreted as a community prevalence estimate. Increasing age was significantly associated with hypertension, with a higher proportion of affected participants in the older age group. Age-related arterial stiffness and vascular changes may contribute to this pattern. The NCD Risk Factor Collaboration documented a substantial global burden of hypertension and persistent gaps in its detection, treatment and control, highlighting the importance of regular blood pressure assessment [6].

Overweight or obesity was another important factor associated with hypertension. Excess body weight may influence blood pressure through changes in sympathetic activity, insulin sensitivity and renal sodium handling. A systematic review and dose-response meta-analysis involving more than 2.3 million participants demonstrated an association between increasing BMI and the risk of developing hypertension [7].

Physical activity is also relevant to blood pressure prevention and management, although its independent association may vary after adjustment for other characteristics [8]. A family history of hypertension remained associated with the condition after adjustment for other variables. This relationship may reflect inherited susceptibility as well as shared dietary and behavioural patterns within households. Indian hypertension guidelines emphasize comprehensive assessment, lifestyle modification and appropriate treatment according

to clinical risk [9]. These measures are particularly relevant for individuals with multiple associated risk factors. The findings have practical implications for outpatient care. Routine blood pressure measurement, weight management, dietary salt reduction, regular physical activity and counselling regarding tobacco and alcohol use can support prevention and control. Evidence-based recommendations emphasize the importance of identifying elevated blood pressure early and combining lifestyle interventions with appropriate clinical management [10,11].

The study has limitations. Its cross-sectional design prevents conclusions about causality or the temporal relationship between risk factors and hypertension. Recruitment from a single tertiary care hospital may limit generalizability, and self-reported lifestyle characteristics may be affected by recall bias. Newly elevated blood pressure also requires confirmation on a separate occasion before a definitive diagnosis is made. Larger multicentre studies with standardized assessment and follow-up could provide more representative estimates and improve understanding of associated factors.

Conclusion

Hypertension was common among the patients included in this hospital-based assessment. Increasing age, overweight or obesity and a family history of hypertension were important factors associated with the condition. Regular blood pressure screening, early clinical assessment and counselling on modifiable lifestyle factors may help improve detection and prevention. The findings should be interpreted within the limitations of a cross-sectional hospital-based design.

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