



INCIDENCE AND ASSOCIATED FACTORS OF HYPERTENSION AMONG HOSPITAL ADULT PATIENTS ABOVE 30 YEARS ATTENDING THE MEDICINE DEPARTMENT AT A SELECTED RURAL TERTIARY TEACHING HOSPITAL

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ABSTRACT

Background: Hypertension is a major non-communicable disease and an important risk factor for cardiovascular morbidity and mortality. The burden is increasing in India, including rural populations. This study assessed hypertension and associated socio-demographic, behavioural, lifestyle, and clinical factors among adult patients attending a rural tertiary teaching hospital.

Methods: A hospital-based cross-sectional study was conducted among 145 adult patients aged 30 years and above attending the outpatient/medicine services of a rural tertiary care teaching hospital. Data were collected using an interviewer-administered structured questionnaire based on the WHO STEPwise approach, together with standardized blood-pressure and anthropometric measurements. Blood pressure was measured after seated rest, using two readings and the average for analysis. Data were analysed using R software and Microsoft Excel; descriptive statistics, Chi-square/Fisher's exact tests, and logistic regression were used.

Results: In the results chapter, 70.1% of participants reported known hypertension, while 42.0% were classified as hypertensive on the measured blood-pressure assessment and 54.3% had elevated blood pressure. Mean systolic and diastolic blood pressure were 131 ± 14.1 mmHg and 89.1 ± 12.0 mmHg, respectively. Sex ($p=0.019$), education ($p<0.001$), extra salt intake ($p=0.033$), and diabetes ($p=0.001$) showed significant associations. Diabetes was the only significant predictor in logistic regression (OR=3.35, 95% CI 1.23–9.11, $p=0.018$).

Conclusion: The study identified a substantial burden of hypertension among hospital attendees. The findings support routine blood-pressure screening, dietary counselling with emphasis on salt reduction, and integrated hypertension–diabetes screening and management in outpatient services.

Key Terms—Hypertension, Blood Pressure, Risk Factors, Diabetes Mellitus, Rural Population, Non-Communicable Disease, WHO STEPS.

I. INTRODUCTION

Hypertension is a chronic condition in which blood pressure remains persistently elevated and is a major modifiable risk factor for cardiovascular disease, stroke, heart failure, chronic kidney disease, and premature mortality. Because many affected individuals are asymptomatic in the early stages, regular screening is important. The dissertation notes that hypertension is increasingly recognized as a major public-health challenge in India and that rural populations are also experiencing a growing burden.

The study background identifies demographic transition, unhealthy dietary practices, physical inactivity, obesity, tobacco use, alcohol consumption, diabetes, and family history as factors relevant to hypertension. Ageing and vascular changes can increase blood pressure, while excess dietary sodium, sedentary behaviour, and obesity may contribute to elevated cardiovascular risk. Diabetes frequently coexists with hypertension and can increase the risk of cardiovascular and renal complications.

Hospital outpatient departments provide an opportunity for opportunistic screening because individuals may have undiagnosed hypertension while attending for other health problems. The dissertation emphasizes the value of standardized blood-pressure measurement and WHO STEPS-based assessment of behavioural, anthropometric, and clinical variables. In the selected rural tertiary teaching hospital, local evidence was considered useful for strengthening screening, counselling, and preventive services.

The study was therefore undertaken to determine the proportion of hypertension and examine associated socio-demographic, behavioural, lifestyle, and clinical factors among adult patients aged 30 years and above attending the selected rural tertiary teaching hospital.

II. AIM AND OBJECTIVES

Aim: To determine the incidence of hypertension and identify associated risk factors among adult patients above 30 years attending outpatient services at a selected rural tertiary teaching hospital.

1. To determine the proportion of adult patients (≥ 30 years) diagnosed with hypertension.
2. To assess socio-demographic characteristics (age, sex, occupation, education) associated with hypertension.
3. To identify behavioural and lifestyle factors (diet, smoking, alcohol, physical activity) and clinical factors (BMI, diabetes, family history) associated with hypertension.

Research Questions

1. What proportion of adult OPD patients are hypertensive by measurement or prior diagnosis?
2. Which socio-demographic and lifestyle factors are associated with hypertension?
3. Is there a significant association between diabetes or family history and hypertension among these patients?

Hypotheses

H0: There is no association between the examined socio-demographic, behavioural, and clinical factors and hypertension among adult OPD attendees. H1: There is a significant association between one or more examined factors and hypertension.

III. RESEARCH METHODOLOGY

Study Design and Setting

A hospital-based cross-sectional study was conducted among adult patients aged 30 years and above attending the outpatient services/Medicine Department of a selected rural tertiary care teaching hospital at Loni, Maharashtra.

Study Population and Sampling

The study population comprised adult patients aged 30 years and above attending the OPDs during the study period. Participants willing to participate and providing written informed consent were included. Critically ill patients unable to participate, patients with cognitive impairment affecting communication or understanding, and those unwilling to participate were excluded. A total of 145 participants were included in the study.

Data Collection Tools and Procedure

Data were collected using an interviewer-administered structured questionnaire based on the WHO STEPwise approach to Surveillance (WHO STEPS). Information covered socio-demographic characteristics, tobacco and alcohol use, dietary practices, physical activity, medical history, diabetes, and family history.

For blood-pressure measurement, participants rested in a seated position for at least five minutes. An appropriate cuff size and standardized procedure were used. Two readings were taken at an interval of 1–2 minutes and the average was considered for analysis. Hypertension was defined in the dissertation as systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg or current use of antihypertensive medication. Weight and height were measured and BMI was calculated.

Validity, Pilot Study and Ethics

The tool was developed from WHO STEPS and relevant literature and reviewed by experts in Community Medicine, Public Health, and Hospital and Healthcare Management. A pilot study was conducted among 11 participants to assess feasibility, clarity, and time required for data collection. Institutional Research Committee approval was obtained vide letter No. PIMS/SPHSM/IRC/2026/449/25 dated 18/11/2025. Written informed consent was obtained and confidentiality was maintained.

Data Analysis

Data were entered, cleaned, coded, and analysed using R software and Microsoft Excel. Frequency, percentage, mean, and standard deviation were used for descriptive analysis. Associations between hypertension and selected variables were examined using appropriate categorical tests, and logistic regression was used to identify predictors. Statistical significance was interpreted at $p < 0.05$.

IV. RESULTS

A total of 145 adult patients aged 30 years and above were included. The mean age was approximately 48.3 ± 16.9 years and 52.1% of participants were male. The results presented in the dissertation indicate substantial hypertension burden among the hospital attendees.

Table 1. Hypertension Status Based on Known Diagnosis

Known Hypertension	Frequency (n)	Percentage (%)
Yes	101	70.1
No	43	29.9
Total	144	100

Table 2. Blood Pressure Classification

BP Classification	Frequency (n)	Percentage (%)
Normal	5	3.6
Elevated / Pre-HTN	75	54.3
Hypertension	58	42.0
Total	138	100

Table 3. Mean Blood Pressure

Variable	Mean $\pm$ SD
Average Systolic BP	131 $\pm$ 14.1 mmHg
Average Diastolic BP	89.1 $\pm$ 12.0 mmHg

The dissertation reports 70.1% known hypertension among 144 respondents in the corresponding table, while the measured blood-pressure classification reports 42.0% hypertension and 54.3% elevated/pre-hypertensive readings. These measures represent different components of the assessment and are retained as reported in the source dissertation.

Table 4. Selected Socio-Demographic Associations

Factor	χ^2	df	p-value	Interpretation
Sex	5.54	1	0.019	Significant
Education	28.5	4	<0.001	Highly significant
Occupation	3.40	5	0.638	Not significant

Behavioural and Clinical Factors

Current tobacco use was reported by 52.4% and alcohol use by 66.2% of participants. Diabetes was reported by 75.9%. Tobacco use, alcohol use, and physical activity were not significantly associated with hypertension. Extra salt intake was significantly associated ($\chi^2=4.52$, $p=0.033$), while diabetes showed a highly significant association ($\chi^2=10.30$, $p=0.001$).

IV. RESULTS (CONTINUED)

Table 5. Association of Behavioural and Clinical Factors with Hypertension

Variable	χ^2	p-value	Result
Tobacco use	0.021	0.885	Not significant
Alcohol use	0.276	0.599	Not significant
Physical activity	0.537	0.464	Not significant
Extra salt intake	4.52	0.033	Significant
Diabetes	10.30	0.001	Highly significant
Family history of HTN	2.82	0.244	Not significant

Table 6. Logistic Regression Predictors of Hypertension

Predictor	Odds Ratio	95% CI	p-value
Age	0.98	0.96–1.01	0.166
Sex	2.05	0.79–5.31	0.140
Tobacco use	0.92	0.40–2.12	0.838
Alcohol use	0.85	0.32–2.29	0.749
Physical activity	1.69	0.71–4.02	0.234
BMI	1.00	0.99–1.00	0.879
Diabetes	3.35	1.23–9.11	0.018
Family history of diabetes	0.84	0.34–2.06	0.700
Family history of hypertension	2.24	0.86–5.84	0.099

Key Findings

The results chapter identifies sex and education as significant socio-demographic factors. Extra salt intake and diabetes were significant behavioural/clinical factors. In the multivariable logistic regression, diabetes was the only statistically significant

predictor, with an odds ratio of 3.35 (95% CI 1.23–9.11; $p=0.018$). Tobacco use, alcohol use, physical activity, BMI, and family-history variables did not reach statistical significance in the final regression model.

The dissertation's hypothesis-testing summary records newly detected associations for sex, education, extra salt intake, and diabetes, while the hypotheses concerning occupation, tobacco, alcohol, and family history were not supported by statistically significant findings.

V. DISCUSSION

The present hospital-based cross-sectional study assessed hypertension among adult OPD attendees at a rural tertiary teaching hospital. The results indicate a substantial burden of hypertension in this hospital-attending population. Known hypertension was reported by 70.1% in the relevant results table, while 42.0% were hypertensive according to the measured blood-pressure classification. The difference reflects the distinction between prior diagnosis/current treatment history and the classification based on the study-period blood-pressure measurements.

The mean age was 48.3 ± 16.9 years and 52.1% of participants were male. Sex showed a statistically significant association with hypertension ($p=0.019$), while education showed a highly significant association ($p<0.001$). Occupation was not significantly associated ($p=0.638$). These findings indicate variation in hypertension status across selected socio-demographic characteristics within the study population.

Among behavioural and lifestyle variables, extra salt intake showed a significant association with hypertension ($p=0.033$). Tobacco use, alcohol use, and physical activity did not demonstrate statistically significant associations in this study. Differences from some previously reported studies may reflect the hospital-based setting, sample characteristics, self-reported behavioural information, or local patterns.

Diabetes demonstrated a strong association with hypertension ($p=0.001$). Logistic regression further identified diabetes as the only statistically significant predictor, with approximately 3.3-fold higher odds of hypertension among diabetic participants ($OR=3.35$; 95% CI 1.23–9.11; $p=0.018$). This supports the importance of integrated screening and management of diabetes and hypertension in outpatient settings.

Comparison with Previous Evidence

The dissertation notes that the observed hospital-based burden is higher than commonly reported community estimates in Indian studies, which may be related to the health profile and comorbidities of hospital attendees. The relationship observed between diabetes and hypertension is consistent with previous literature describing their frequent coexistence. The association with additional salt intake is also consistent with the established role of dietary sodium in blood-pressure control. However, tobacco and alcohol were not statistically significant in the present analysis, unlike some earlier studies.

Limitations

The cross-sectional design does not establish causal relationships. Data were collected from a single rural tertiary hospital, limiting generalizability. Some behavioural variables were self-reported and may be affected by reporting bias. Blood-pressure measurements represented the study period and may not reflect long-term blood-pressure status. Certain missing values were present in selected variables.

VI. IMPLICATIONS AND CONCLUSION

Implications for Practice and Public Health

The findings support strengthening routine blood-pressure screening in outpatient departments, particularly for adult attendees. Patient counselling can emphasize reduced salt intake, healthy dietary practices, physical activity, and appropriate follow-up. Because diabetes was strongly associated with hypertension and was the significant predictor in the regression model, integrated screening and management of both conditions can be incorporated into outpatient non-communicable disease services.

Recommendations

- ❖ Introduce routine blood-pressure screening for adult OPD attendees.
- ❖ Strengthen counselling on reduced salt intake and healthy lifestyle practices.
- ❖ Conduct regular awareness programmes regarding hypertension prevention.
- ❖ Integrate hypertension and diabetes screening services.
- ❖ Develop patient follow-up systems for early treatment and monitoring.
- ❖ Encourage community-based hypertension prevention programmes.

VII. CONCLUSION

The study concluded that hypertension was highly prevalent among adult patients attending the selected rural tertiary teaching hospital. Sex and education were significantly associated with hypertension, as was extra salt intake. Diabetes showed a strong association with hypertension and emerged as the only statistically significant predictor in the logistic regression analysis. The findings emphasize the importance of regular blood-pressure monitoring, dietary modification, and integrated management of hypertension and diabetes at the outpatient level.

Further Direction for Research

Future research directions identified in the dissertation include multicentric studies with larger sample sizes, longitudinal designs to establish temporal relationships, inclusion of biochemical investigations and long-term follow-up, assessment of awareness and treatment adherence, quality-of-life studies, and comparison of rural and urban populations.

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