

# Exploring Predisposing Factors and Awareness of Hypertension in a Rural Indian Community

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**Abstract:** *Hypertension is a critical public health challenge, often undetected or uncontrolled. This study identifies predisposing factors associated with hypertension and evaluates awareness levels among adults in a rural Indian community. A community-based cross-sectional study using pre-tested questionnaires and statistical methods revealed that lifestyle factors like smoking, alcohol consumption, high BMI, and physical inactivity significantly increase hypertension prevalence. Alarming, only 49% of hypertensives were aware of their condition, with just 25% receiving treatment. Findings underscore the urgent need for educational initiatives integrated into primary healthcare to improve awareness and management of hypertension.*

**Keywords:** Hypertension, rural health, risk factors, smoking and alcohol, physical inactivity

## 1. Introduction

The global burden of hypertension is increasing due to an ageing population and increasing prevalence of obesity and it is estimated to affect one third of the world's population by 2025 [1, 10]. prevalence of chronic diseases is showing an upward trend in most countries due to Increasing life expectancy in most countries and greater number of people are living to older ages and are at greater risk to chronic diseases of various kinds, the rapidly changing life styles and behavioral pattern of the people (e.g. smoking, alcoholism etc.) as infectious disease rates decline, the burden of noncommunicable diseases is becoming a significant challenge for developing nations. Hypertension is one of the most important contributors to heart disease stroke which together make up the world's number one cause of premature death and disability. Hypertension is reported to be the seventh contributor to premature death in developing countries. Recent reports indicate that nearly 1 billion adults had hypertension in 2000 and this is predicted to increase to 1.56 billion by 2025 [1, 11]. The prevalence of hypertension in the early twentieth century varied among different studies in Rural India from 2 to 8%, and increases with age in all populations [5, 10]. Various factors might have contributed to this raising trend. Prevalence among rural adults has increased from 10-15%. Hypertension awareness and control status is low and only a quarter of the rural people being aware of its presence. Preventive measures are required so as to reduce obesity, increasing physical activity, decreasing salt intake and related risk behaviors.

## 2. Objectives

This study aims to explore the predisposing factors associated with hypertension and assess awareness levels among adults in a rural Indian community. By identifying key lifestyle and

demographic contributors to hypertension, the research seeks to provide evidence-based insights for designing targeted interventions. The findings are intended to enhance awareness and management strategies, particularly through integrating educational programs into existing primary healthcare systems. This effort is critical to addressing the growing public health burden of hypertension in underserved rural settings.

## 3. Review of Literature

- **Family History:** Priyanga Ranasinghe et al., (2015) had studied on the influence of family history of hypertension on disease prevalence and associated metabolic risk factors among Sri Lankan adults [3]. The prevalence of hypertension was significantly higher in those with a family history of hypertension. Gopinath, S.L. Chandha in their epidemiological study of hypertension carried out on a random urban sample of young persons (15.24 yrs) of Delhi and found 43.1% of hypertensive had Family History of hypertension [3].
- **Physical Activity:** Seth S. Mekhanto et al., (2012) experimented on the association of body weight and physical activity with blood pressure in a rural population in Limpopo province in South Africa. Evidenced that a relationship between physical activity and hypertension as the favorable effects of exercise on blood pressure reduction
- **Smoking and Alcohol:** Gupta et al., (1995) found smoking and alcohol intake both individually and collectively were related to high prevalence of hypertension as well as Coronary Artery Disease (C.A.D.).
- **Body Mass Index BMI:** Ming Zhang et al., (2017) studied to examine the effect of change in body mass index (BMI) on incident hypertension by gender and age groups.

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Study findings showed that risk of hypertension was high for non-hypertensive people in rural China with stable obesity [6]. BMI dynamic gain may be related to incident hypertension for men of all ages and young and middle-aged women.

- **Salt: Amalia Pesantes et.al, (2017),** assessed relationship between salt consumption and hypertension. It was notified that strong association between emotional wellbeing and hypertension, give a positive spin to changing food habits, and resist the “common sense” strategy of information provision around the causal connection between salt consumption and hypertension.
- **Urinary Sodium and Potassium ratio** Kaufman J.S. et al., (2015) found mean sodium potassium ratio in 24 hour urine sample was 2.6 (1.0) and higher among urban residents correlated with systolic and diastolic blood pressure.
- **Multiple Risk Factors:** Clara K. Chow et al., (2013) in their multi variate analysis revealed that age, higher BMI and higher socioeconomic status were independently associated with hypertension in both sexes. Higher dietary fat and salt intake and lower physical activity were weakly but significantly associated with hypertension.

#### 4. Materials and Methods

A cross sectional study was conducted among 1324 samples [2, 4] in the Primary Health Centre (Kaveripakkam) area, using cluster sampling technique.

##### 4.1 Study Population

Adult's population aged 20 years and above of both sexes was considered eligible to be included in the study.

##### 4.2 Study Instrument

A comprehensive structured questionnaire consisting of objective type question was developed and modified by pilot testing and on expert advice. The first part sought information on the sociodemographic aspect like age, sex, occupation, and education, per capital income, marital status. The second part sought information on the lifestyle like smoking, alcohol consumption, physical activity, family history of hypertension, Diabetes, dietary habits and oral contraceptive use and third part consists of question regarding the awareness about hypertension among the study population, followed by measurement of blood pressure and calculation of BMI.

##### 4.3 Statistical Analysis

Data entry was made using FoxPro software and analysis was done using EPI 6 and SPSS packages. Percentage was calculated for variables and 95% confidence intervals were calculated (Appendix IV), The chisquare test was used as test of significance. Coefficient regression was calculated to check the correlation of variables with systolic and diastolic blood pressure.

#### 5. Limitation

A potential limitation of this study is the reliance on single-occasion blood pressure measurements, which may overestimate hypertension prevalence by up to 17%. Future studies could improve reliability by incorporating repeated measurements over multiple visits or using 24-hour ambulatory blood pressure monitoring.

#### 6. Results

##### 6.1 Habits

Smokers (348) and alcoholics (582) were found in the study population. Other habits like pan/tobacco chewing were very few hence not considered for analysis.

##### 6.2 Smoking

The prevalence of hypertension was more in smokers (30.93%) than the nonsmokers (20.31%) [4]. Even the ex-smokers had higher prevalence (46.67%). The O.R. of hypertension among smokers (including ex-smokers) was 2.01 (C.I. 1.41 to 2.86) Table 1.

**Table 1: Smoking And Hypertension**

Habit	Hypertension	Normal	Total	Chi Square	P-Value
Smoking					
Yes	(30.93%) 301	157	458	(30.93%) 301	0.000** H.S.
No	(20.31%) 169	155	224	21.79	
Ex	(46.67%) 418	124	524		

Among 66 smokers who smoked 1020 cigarettes/day, 31 individuals (47%) developed hypertension, whereas 18 individuals (53%) developed hypertension out of 34 who smoked >20 cigarettes/day. Trend Chisquare (16.32) (P00005) showed a significant increase in hypertension.

**Table 2: Duration of Smoking and Hypertension**

Period	Hypertension	Normal	Total	OR
≤ 5 years	210	57	267	1.00
6 -10 years	96	73	169	4.50
11-15 years	118	238	356	7.38
16-20 years	135	39	174	9.86
21 years & More	329	29	358	10.55
Total	888	436	1324	

In this study, the prevalence of hypertension increased as the duration of smoking increased.

##### 6.3 Alcoholic

The prevalence of Hypertension was significantly higher in alcoholics (chisquare=39.82, p=0.0000) than non-alcoholics (45.28% among alcoholic, where as 19.79% in nonalcoholic), Even the ex-alcoholic had higher prevalence (41.30%).

Compared to nonalcoholic (Table 3)

**Table 3:** Alcoholic And Hypertension

Habit	Hypertension	Normal	Total	Chi Square	P-Value
Alcohol Yes	(30.93%) 301	157	458	21.79	0.000** H.S.
No					
Ex	(20.31%) 169	155	224		
<b>Total</b>	<b>(46.67%) 418</b>	<b>124</b>	<b>524</b>		

**6.4 Family History**

The prevalence of hypertension was more in individuals with family history than in individuals with no Family History.

**Table 4:** Family History of Hypertension

Family History	Hypertension	Normal	Total	Chi- square	P-value	OR
Father				40.91	0.0000** H.S.	4.23 (2.61- 6.88)
Yes	57	75	132			
No	49	273	322			
Not Known	91	265	356			
Mother				16.26	0.0000** H.S.	2.67 (1.59- 4.47)
Yes	37	56	93			
No	73	295	368			
Not Known	87	262	349			
Both Parent				13.32	0.0003** H.S.	4.28 (1.73-10.69)
Yes	13	11	24			
No	85	308	393			

**6.5 Food Habit**

The prevalence of hypertension among the study population did not show any relation to the food habit (Table 5).

**Table 5:** Hypertension And Food Habits

Food	Hypertension	Normal	Total
Vegetarian	535	91	623
Non-Vegetarian	353	345	698
<b>Total</b>	<b>888</b>	<b>436</b>	<b>1324</b>

P = 0.5406.

**7. Awareness About Hypertension in the Study Population**

The level of awareness regarding high blood pressure among the study population was significantly different between those with hypertension and the normal subjects. This, was 62.94% among hypertensions and only 53.01% among normal individual (Table 6).

**Table 6:** Awareness About High Blood Pressure

BP Awareness	Hypertension	Normal	Total
Aware	538	238	776
Not-aware	350	198	548
<b>Total</b>	<b>888</b>	<b>436</b>	<b>1324</b>

P = 0.0147

**Table 7:** Percentage of persons with hypertension who were aware treated and controlled

Hypertensives (n = 888)		
Aware	Treated	Controlled
776	594	182
59 %	45 %	14 %

**8. Discussion**

The habits of smoking and alcohol consumption were widely prevalent among males in this study population and found

strongly associated with hypertension. Analysis showed that the prevalence of hypertension were found increasing as the quantity (Number of eighties / day) and duration of smoking increased in the community. Therefore these personal habits were considered most important in the aetiopathogenesis of hypertension in these population. Similar association were found in the other studies also.

There was a close link between the hypertension and family history of hypertension in this study population. Individuals with history of hypertensive father showed an increased prevalence of hypertension (OR4.23) than the individuals with history of hypertensive mothers (OR2.67), whereas, if both the parents were hypertensive, the prevalence of hypertension was still higher. (O.R. 4.28). Gopinath N. et al., (1994) in their epidemiological study of hypertension in the urban sample of young persons (1520 years) in Delhi also found that family history of hypertension was present in 43. 1% of hypertensives.

Only 49% of the hypertensives were aware of their blood pressure status, and only 25% of them were being treated. It is noteworthy that only 6% were controlled with medication [9].

Ali Haider Mohamad et al., (2009) conducted a study on the knowledge, awareness and attitude among the hypertensive population of Kuala Lumpur and rural areas of Selangor (Malaysia) and noticed 47% of the hypertensive individuals were aware of being hypertensive, 35% were treated and only 7.6% were controlled with the medication.

**9. Recommendations**

Imparting appropriate training to medical and paramedical personnel in P.H.C. to reorient their approaches in diagnosis and treatment of elevated blood pressure would be crucial.

## 10. Conclusion

A striking lack of awareness of elevated blood pressure was found among the participant and the suboptimal rate of control among those treated. To achieve the final goal of eliminating all blood pressure related diseases in this community, detection and treatment of hypertension must be complemented by equally energetic approaches directed at primary and primordial prevention of hypertension [7].

This study underscores the pressing need to address hypertension in rural areas through community-based education and preventive measures targeting modifiable risk factors. By integrating these efforts into primary healthcare, the burden of hypertension-related diseases can be significantly reduced.

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