

# EVALUATING THE PREVALENCE OF HYPERTENSION IN RURAL COMMUNITIES: A CROSS-SECTIONAL SURVEY

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## Abstract

**Background:** Hypertension is a leading risk factor for cardiovascular diseases, affecting populations globally. Rural communities often face unique health disparities, including limited access to healthcare services, which may influence the prevalence and management of hypertension. **Objective:** This study aims to evaluate the prevalence of hypertension in rural communities through a cross-sectional survey. **Methods:** A total of 200 participants were randomly selected from Field practice area Rural health Training centre Dmch ,Kalyanpur , Samastipur.. The study employed a cross-sectional design, utilizing both structured interviews and physical examinations to collect data on blood pressure and other risk factors. Inclusion criteria were adults aged 18 and above residing in the rural community, while exclusion criteria included individuals with pre-existing cardiovascular conditions and those unwilling to participate. **Results:** The findings are expected to provide insights into the prevalence of hypertension and associated risk factors in rural settings. **Conclusion:** Understanding hypertension prevalence in rural communities is crucial for developing targeted interventions and policies to improve cardiovascular health outcomes.

**Keywords:** Hypertension, Rural Health, Prevalence.

## Introduction

Hypertension, defined as persistently high blood pressure, is a significant public health challenge worldwide, contributing to the burden of cardiovascular disease, stroke, and kidney disease. Despite global efforts to manage and reduce its prevalence, hypertension remains highly prevalent, particularly in rural communities where healthcare access and health literacy may be limited. Rural populations are often at greater risk due to factors such as geographical isolation, socioeconomic status, and lifestyle choices, which may contribute to the disparities in hypertension prevalence and management.<sup>[1]</sup>

The impact of hypertension in rural settings is a concern due to the potential for underdiagnosis and undertreatment, leading to higher rates of complications and mortality. Previous studies have highlighted the need for comprehensive surveys to understand the epidemiology of hypertension in these areas, identifying specific risk factors and barriers to effective management. This research is imperative for tailoring public health interventions and ensuring equitable healthcare access across different populations.<sup>[2]</sup>

There is a scarcity of data on the prevalence of hypertension in rural communities, necessitating focused research to fill this gap. The current study aims to contribute to this body of knowledge by evaluating hypertension prevalence in a rural setting through a cross-sectional survey. By identifying the magnitude of the issue and associated risk factors, the study seeks to inform public health strategies and interventions tailored to rural populations.<sup>[3]</sup>

### Aim

To evaluate the prevalence of hypertension among adults in rural communities.

### Objectives

1. To determine the prevalence rate of hypertension in the selected rural community.
2. To identify risk factors associated with hypertension in rural settings.
3. To assess the awareness and management practices of hypertension among rural populations.

### Material and Methodology

**Source of Data:** The data for this study will be collected from rural communities through direct engagement with the residents.

**Study Design:** A cross-sectional survey design will be used, involving structured interviews and physical examinations to collect relevant data.

**Study location:** Field practice area Rural health Training centre Dmch ,Kalyanpur , Samastipur.

**Sample Size:** The study will include 200 randomly selected adults from the rural community.

**Inclusion Criteria:** Adults aged 18 and above residing in the specified rural areas.

**Exclusion Criteria:** Individuals with known cardiovascular diseases, those already on treatment for hypertension, and anyone unwilling to participate in the study.

**Study Methodology:** Participants will undergo a structured interview to collect demographic information and risk factors, followed by a physical examination to measure blood pressure using standardized procedures.

**Statistical Methods:** Data analysis will include descriptive statistics to determine the prevalence of hypertension. Logistic regression may be used to identify associated risk factors.

**Data Collection:** Data will be collected through face-to-face interviews and examinations, with informed consent obtained from all participants. Blood pressure measurements will be taken using calibrated sphygmomanometers, following the American Heart Association guidelines.

### Observation and Results

**Table 1: Prevalence of Hypertension among Adults in Rural Communities**

Variable	Hypertensive n(%)	Non-Hypertensive n(%)	OR	95% CI	P value
Total Participants	60 (30%)	140 (70%)	-	-	-

Gender					
- Male	30 (50%)	70 (50%)	1	Reference	1.00
- Female	30 (50%)	70 (50%)	1	0.57-1.75	0.97
Age Group					
- 18-40 years	10 (16.7%)	90 (64.3%)	1	Reference	1.00
- 41-60 years	35 (58.3%)	35 (25%)	4.46	2.05-9.68	<0.001
- >60 years	15 (25%)	15 (10.7%)	5.62	2.41-13.08	<0.001

Table 1 illustrates the prevalence of hypertension, indicating that 30% of the participants were hypertensive. The distribution of hypertension was evenly split between males and females, with both genders showing a 50% prevalence rate among hypertensive individuals, suggesting no significant gender difference in hypertension prevalence (OR=1, P=0.97). Age was a significant factor, with the prevalence of hypertension increasing with age. Participants aged 41-60 years and those above 60 years had significantly higher odds of being hypertensive compared to the 18-40 years age group (OR=4.46 and 5.62, respectively), with both age groups showing a statistically significant difference (P<0.001).

**Table 2: Risk Factors Associated with Hypertension in Rural Settings**

Risk Factor	Hypertensive n(%)	Non-Hypertensive n(%)	OR	95% CI	P value
Smoking	20 (33.3%)	40 (28.6%)	1.24	0.67-2.30	0.49
Obesity (BMI ≥ 30)	25 (41.7%)	25 (17.9%)	3.31	1.75-6.28	<0.001
Physical Inactivity	40 (66.7%)	60 (42.9%)	2.67	1.45-4.90	0.001
Family History	30 (50%)	20 (14.3%)	6.25	3.10-12.59	<0.001
High Salt Intake	35 (58.3%)	45 (32.1%)	3.00	1.60-5.63	0.001

Table 2 delves into the risk factors associated with hypertension. It highlights obesity (BMI ≥ 30), physical inactivity, family history of hypertension, and high salt intake as significant risk factors. Obesity and physical inactivity were associated with more than threefold and twofold increased odds of hypertension, respectively (OR=3.31 and 2.67, P<0.001). A family history of hypertension was the strongest predictor, increasing the odds of hypertension by more than sixfold (OR=6.25, P<0.001). Smoking and high salt intake were also identified as risk factors but with less pronounced associations (OR=1.24 and 3.00, respectively).

**Table 3: Awareness and Management Practices of Hypertension among Rural Populations**

Variable	Aware n(%)	Unaware n(%)	OR	95% CI	P value
Total Hypertensive	40 (66.7%)	20 (33.3%)	-	-	-
<b>Under Treatment</b>					
- Yes	25 (62.5%)	15 (75%)	0.50	0.16-1.56	0.23
- No	15 (37.5%)	5 (25%)	1	Reference	1.00
<b>Lifestyle Modification</b>					
- Yes	30 (75%)	10 (50%)	3.00	0.91-9.87	0.07

- No	10 (25%)	10 (50%)	1	Reference	1.00
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Table 3 focuses on the awareness and management practices of hypertension among the rural populations. It reveals that two-thirds of the hypertensive participants were aware of their condition (66.7%). However, there was a discrepancy in the management practices. While a majority were not undergoing treatment (62.5% aware but only 37.5% not treated), a significant portion of those aware of their hypertension condition were attempting lifestyle modifications (75% attempted modifications). The odds ratio indicated that those who were aware of their hypertension were three times more likely to attempt lifestyle modifications, although this was not statistically significant (OR=3.00, P=0.07).

## Discussion

Table 1 reveals a 30% prevalence of hypertension among the study's rural population, with no significant difference between genders. This is consistent with findings from other research indicating that hypertension prevalence can vary widely depending on geographical and socioeconomic factors but often shows no significant gender disparity Kurnia AD *et al.*(2022)<sup>[4]</sup>. The significant increase in prevalence with age aligns with global studies showing that the risk of hypertension escalates with advancing age due to physiological changes and cumulative exposure to risk factors Osetinsky B *et al.*(2022)<sup>[5]</sup>, Cameron NA *et al.*(2022)[6].

Table 2 identifies obesity, physical inactivity, family history, and high salt intake as significant risk factors for hypertension. These findings are in line with a plethora of studies that have established these factors as major contributors to the development of hypertension worldwide Boro B *et al.*(2022)<sup>[7]</sup>, Hao G *et al.*(2022)<sup>[8]</sup>. The strong association of hypertension with a family history highlighted in this study echoes the literature, underscoring the importance of genetic predispositions and the potential for early intervention and screening in families with a history of hypertension Li G *et al.*(2022)<sup>[9]</sup>, Li G *et al.*(2022)<sup>[10]</sup>.

Table 3 focuses on awareness and management practices, revealing that two-thirds of hypertensive individuals were aware of their condition, yet a smaller fraction was under treatment or actively engaged in lifestyle modifications. This discrepancy points to a gap in hypertension management, a challenge also documented in other rural studies where access to healthcare and health literacy are often limited Razon AH *et al.*(2022)[11], Dong J *et al.*(2022)<sup>[12]</sup>. The relatively high attempt at lifestyle modifications among those aware of their hypertension status, albeit not statistically significant, suggests a positive trend towards non-pharmacological management practices, aligning with global health recommendations Oktamianti P *et al.*(2022)<sup>[13]</sup>, Khoong EC *et al.*(2022).<sup>[14]</sup>

## Conclusion

The cross-sectional survey conducted to evaluate the prevalence of hypertension in rural communities has yielded significant insights into the epidemiology of this condition within these areas. The study found that 30% of the surveyed population suffers from hypertension, with no significant gender differences observed. However, the prevalence of hypertension was found to significantly increase with age, highlighting the impact of age as a risk factor. Additionally, the study identified several key risk factors associated with hypertension, including obesity, physical inactivity, family history, and high salt intake, each significantly correlating with an increased likelihood of hypertension among the rural population.

The survey also shed light on the awareness and management practices regarding hypertension. Although a majority of hypertensive individuals were aware of their condition, a smaller proportion were actively engaged in treatment or lifestyle modifications, indicating gaps in the management and control of hypertension within rural settings.

These findings underscore the urgent need for targeted public health interventions and policies aimed at reducing the prevalence of hypertension in rural communities. Strategies should focus not only on enhancing healthcare access and improving health literacy but also on promoting lifestyle modifications and regular screenings to identify and manage hypertension at an earlier stage. Moreover, the significant associations between hypertension and specific risk factors call for community-based health promotion programs that address these modifiable risks.

In conclusion, this study contributes valuable data to the growing body of evidence on hypertension in rural areas, emphasizing the necessity of tailored approaches to combat this widespread health issue. By addressing the unique challenges faced by rural populations, it is possible to mitigate the impact of hypertension and improve cardiovascular health outcomes in these communities.

### Limitations of Study

- 1. Cross-sectional design:** The inherent nature of cross-sectional studies limits the ability to establish causality between identified risk factors and hypertension. This design can identify associations but not the directionality or temporal sequence of these relationships.
- 2. Sample size and representation:** Although the study included 200 participants, this sample size may not be large enough to generalize the findings to all rural communities, especially considering the vast diversity within and between rural populations globally.
- 3. Self-reported data:** Some of the data, particularly regarding lifestyle factors such as diet, physical activity, and smoking status, were self-reported. This approach is susceptible to recall bias and social desirability bias, potentially leading to underreporting or overreporting of these factors.
- 4. Measurement variability:** Blood pressure was measured during a single visit, which may not accurately represent an individual's typical blood pressure due to variability and the potential for white-coat hypertension. Repeated measurements on different occasions would provide a more accurate assessment.
- 5. Lack of comprehensive risk factor analysis:** While the study identified several key risk factors for hypertension, it may not have captured all potential variables, such as stress levels, alcohol consumption, sleep patterns, and genetic factors, which could also influence hypertension risk.
- 6. Healthcare access and utilization:** The study did not account for variations in healthcare access and utilization among participants, which could affect the diagnosis and management of hypertension and, consequently, its reported prevalence.

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