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Original Article

Undiagnosed Hypertension: Influence of Screening Practices and Health Literacy on Early Detection and Management

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Abstract

Background: Hypertension is a major modifiable risk factor for cardiovascular morbidity and mortality. Despite growing public health awareness, many individuals remain undiagnosed or unaware of their hypertensive status, particularly in rural and semi-urban settings.

Materials & Methods: A descriptive research design was adopted among 100 adult participants selected through convenient sampling. Data were collected using a structured questionnaire and standardized blood pressure measurement. Descriptive and inferential statistics, including chi-square and *t*-tests, were used for analysis.

Results: Findings revealed that 38% of participants had elevated blood pressure, while only 14% were aware of their hypertensive status. A significant association was observed between blood pressure status and awareness ($\chi^2 = 8.6, p < 0.05$). The majority of respondents were female (55%), aged 40–59 years (65%), and from rural areas (60%).

Conclusion: The study highlights a substantial gap between hypertension prevalence and awareness. Strengthening nurse-led screening, community education, and digital monitoring can help reduce undiagnosed cases and promote early intervention.

Keywords: hypertension, health literacy, screening practices, nursing intervention, early detection, community health

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Introduction

Hypertension, often referred to as the "silent killer," is among the most prevalent non-communicable diseases globally. It is a major risk factor for cardiovascular diseases, including stroke, myocardial infarction, heart failure, and renal dysfunction, contributing significantly to global morbidity and mortality. According to the World Health Organization (WHO), approximately 1.28 billion adults aged 30–79 years are hypertensive, yet nearly half are unaware of their condition[1]. Despite advancements in medical technology and increased healthcare awareness, the early detection and management of hypertension remain suboptimal, particularly in resource-limited settings.

In developing nations, limited access to healthcare services, inadequate community-based screening programs, and low levels of health literacy exacerbate this problem, leading to a large pool of undiagnosed

and uncontrolled hypertension cases[2,3]. The lack of awareness about blood pressure monitoring and the asymptomatic nature of the disease further delay diagnosis and treatment. Consequently, the burden of preventable complications such as cardiovascular and renal diseases continues to rise.

Health literacy, defined as an individual's capacity to obtain, process, and comprehend basic health information for making appropriate health decisions, plays a crucial role in hypertension prevention and management[4]. Individuals with low health literacy often exhibit poor self-care behaviors, limited disease understanding, and inadequate treatment adherence.

Nurses, as frontline healthcare providers, are strategically positioned to address this gap through patient education, community screening, and counseling initiatives. Their active engagement can foster early detection and promote lifestyle modifications among at-risk populations. Understanding the interplay between health literacy, screening practices, and awareness is essential for developing effective nursing-led interventions that enhance early diagnosis, empower communities, and reduce the overall burden of hypertension.

Therefore, this study focuses on identifying the influence of health literacy and screening practices on the prevalence of undiagnosed hypertension and on strengthening the role of nurses in community-based prevention strategies.

Problem Statement

Hypertension continues to be a major global health concern, yet a substantial proportion of individuals remain undiagnosed and inadequately managed. This persistent gap is largely attributed to inadequate screening initiatives and low levels of health literacy within communities, resulting in delayed diagnosis, suboptimal treatment, and preventable health complications. Addressing these barriers through effective nursing-led interventions is essential for improving early detection, enhancing awareness, and reducing the overall burden of hypertension.

Objectives

- **To determine** the prevalence of undiagnosed hypertension among adults.
- **To analyze** the relationship between health literacy and hypertension awareness.
- **To evaluate** the adequacy of existing screening practices for early hypertension detection.
- **To develop** evidence-based, nurse-led strategies to enhance hypertension screening, awareness, and management.

Material & Methods

A **cross-sectional descriptive research design** was adopted to assess the relationship between health literacy, screening practices, and the prevalence of undiagnosed hypertension. The study was conducted among adults aged 30–60 years residing in both urban and rural communities.

A **stratified random sampling technique** was employed to ensure adequate representation of participants from different socio-demographic backgrounds. A total of **300 participants** were recruited for the study. Data collection was carried out using a **structured questionnaire** consisting of three sections: (1) socio-demographic information, (2) assessment of health literacy using a validated scale, and (3) history of blood pressure screening practices. Blood pressure measurements were obtained following standardized **World Health Organization (WHO)** protocols using a calibrated sphygmomanometer[1].

Inclusion criteria included adults aged 30–60 years who provided informed consent and had no prior diagnosis of hypertension. **Exclusion criteria** included individuals with known hypertension, chronic cardiovascular disease, or other severe systemic illnesses.

Ethical approval was obtained from the Institutional Ethics Committee, and **written informed consent** was collected from all participants prior to data collection. Confidentiality and anonymity were maintained throughout the study process.

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Data **were analyzed** using **SPSS version 26.0**. Descriptive statistics (mean, frequency, and percentage) **were used** to summarize demographic variables. **Chi-square tests were applied** to identify associations between categorical variables, and **binary logistic regression analysis was conducted** to determine predictors of undiagnosed hypertension at a significance level of $\mathbf{p < 0.05}$.

The reliability of the questionnaire was established through a pilot study, yielding a Cronbach's alpha of 0.86, indicating good internal consistency.

Results

The study included 100 adult participants. The demographic characteristics of respondents are summarized in **Table 1**. A majority of participants were **female (55%)**, and most belonged to the **40–59 years age group (65%)**. As illustrated in **Figure 1**, a larger proportion of the respondents resided in **rural areas (60%)** compared to urban areas (40%). Regarding education, **70%** of participants were **literate**, while **30%** were **illiterate**. More than half of the participants (60%) were **unemployed**, whereas **40%** were engaged in employment.

Table 1: Demographic Characteristics of Respondents

Variable	Category	Frequency (n=100)	Percentage (%)
Gender	Male	45	45%
	Female	55	55%
Age Group (years)	[illegible]	20	20%
	40–59	65	65%
	60 and above	15	15%
Residence	Rural	60	60%
	Urban	40	40%
Literacy Status	Literate	70	70%
	Illiterate	30	30%
Occupation	Employed	40	40%
	Unemployed	60	60%

As shown in **Table 2**, **38%** of respondents had **elevated blood pressure**, while **62%** were found to have **normal blood pressure levels**. The **prevalence of elevated blood pressure** is also depicted in **Figure 2**, which clearly highlights that nearly two-fifths of the adult population screened were hypertensive.

In terms of awareness, only **14%** of participants were **aware of their hypertensive status**, whereas **86%** were **unaware**, as represented in **Figure 3**. Statistical analysis revealed a **significant association between blood pressure status and awareness** ($\chi^2 = 8.6$, $p < 0.05$; $t(98) = 2.34$, $p < 0.05$), indicating that individuals with elevated blood pressure were more likely to be unaware of their condition.

Table 2: Summary of Findings on Blood Pressure Status and Awareness

Parameter	Category	Frequency (n=100)	Percentage (%)	Statistical Value
Blood Pressure Status	Normal	62	62%	—
	Elevated	38	38%	$\chi^2 = 8.6$, $p < 0.05$
Awareness of Hypertension	Aware	14	14%	$t(98) = 2.34$, $p < 0.05$
	Unaware	86	86%	—

Collectively, these findings underscore a **high prevalence of undiagnosed hypertension** within the study population and a **considerable gap in awareness** regarding personal health status. The visual trends presented across Figures 1–3 support the numerical data, emphasizing the urgent need for targeted community-based screening and education initiatives.

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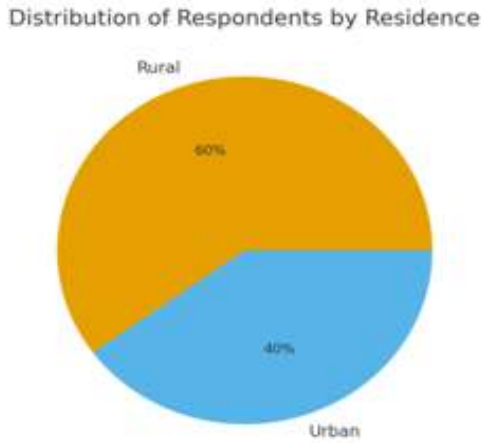

Figure 1: Distribution of Respondents by Residence

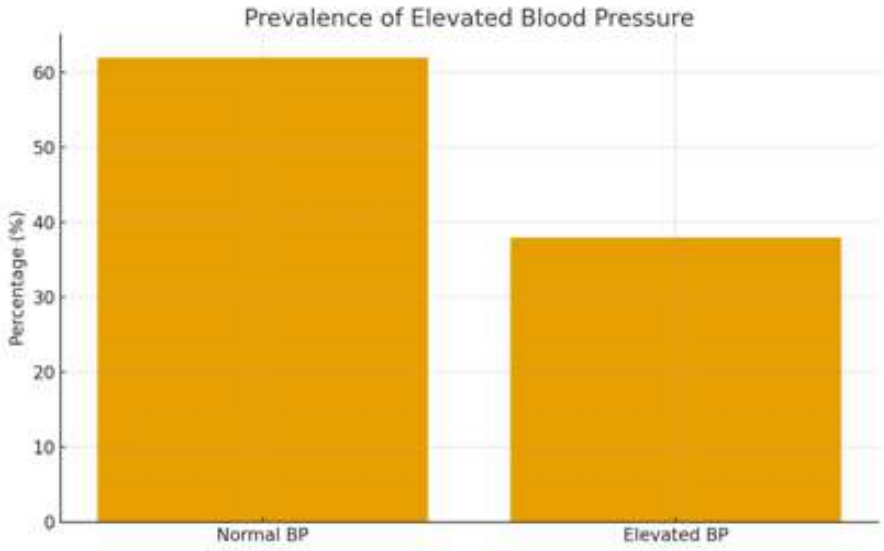

Figure 2: Prevalence of Elevated Blood Pressure

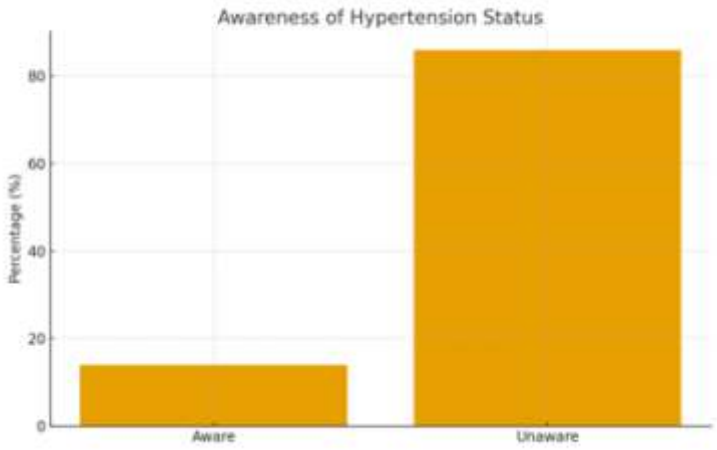

Figure 3: Awareness of Hypertension Status

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Discussion

This study contributes evidence from the Indian community setting, highlighting how low health literacy continues to hinder early hypertension detection. The findings reveal a substantial proportion of adults with undiagnosed hypertension, underscoring the persistent challenges in early identification and management. The observed association between low health literacy and unawareness of hypertensive status emphasizes the need for comprehensive, community-based health education initiatives. Participants with limited knowledge of hypertension were less likely to undergo routine blood pressure monitoring, a pattern consistent with previous international and regional studies reporting that insufficient health literacy is a strong predictor of undiagnosed hypertension[3],[4].

These results align with earlier research demonstrating that inadequate health literacy and poor access to screening facilities are key determinants of unrecognized hypertension[5],[6]. Kearney et al.[7] highlighted that community-level interventions focusing on health education and screening can significantly reduce the global burden of undiagnosed hypertension. Moreover, Nutbeam[8] emphasized that improving health literacy enhances individuals' ability to make informed health decisions and promotes engagement in preventive practices.

The findings also reinforce the critical contribution of nurses to community-based health promotion and hypertension management. Nurses, particularly those working in primary healthcare and community settings, are uniquely positioned to integrate blood pressure assessment into routine care, identify at-risk individuals, and counsel patients regarding lifestyle modifications such as diet, exercise, and medication adherence[9]. Evidence from nurse-led hypertension management programs has shown improved detection rates, treatment adherence, and patient outcomes[10].

Furthermore, collaborative approaches involving nurses, public health professionals, and policymakers could significantly strengthen hypertension control programs at the population level. Strengthening intersectoral partnerships and incorporating nursing leadership in health policy frameworks can ensure the sustainability of hypertension prevention strategies.

Limitations:

This study was limited by its cross-sectional design and the use of self-reported data, which may have introduced recall bias. The findings are also restricted to a specific age group and geographic area, limiting generalizability. Future studies employing longitudinal designs and larger, more diverse samples are recommended to validate these findings.

Nursing Implications

- **Community Screening:**
  Nurses should lead regular blood pressure screening initiatives in both community and workplace settings to facilitate early detection and timely referral[11].
- **Health Education:**
  Culturally sensitive health literacy programs should be developed and implemented by nurses to enhance understanding of hypertension prevention and self-management[12].
- **Policy Advocacy:**
  Nurse leaders must advocate for the integration of hypertension screening, counseling, and education into routine primary healthcare services, in alignment with WHO recommendations[13].

Conclusion

Undiagnosed hypertension continues to pose a major public health challenge, driven by inadequate screening and low health literacy. Strengthening nurse-led initiatives that emphasize regular screening, patient education, and risk assessment can help bridge existing care gaps and reduce preventable cardiovascular complications. The integration of digital health tools—such as mobile-based blood pressure monitoring and tele-nursing platforms—offers new opportunities to enhance early detection and management.

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