



AN INVESTIGATION OF KNOWLEDGE, AWARENESS, AND MEDICATION ADHERENCE AMONG HYPERTENSIVE PATIENTS

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Abstract:

Background: Hypertension is a growing public health concern linked to cardiovascular disease. Effective management hinges on patients' knowledge about the condition and their adherence to medication. This study assessed these factors in a North Indian tertiary care hospital. **Methods:** A cross-sectional study recruited 1000 participants (April 2021-October 2022) using systematic random sampling. Validated Morisky questionnaires evaluated knowledge and medication adherence. Data analysis was performed with SPSS software. **Results:** Among the 1000 participants (520 male, 480 female), 78.3% demonstrated adequate general knowledge of hypertension. However, a concerning knowledge gap existed regarding individual disease status. Notably, 21.7% were unaware of their diagnosis, 33.6% couldn't recall their diagnosis blood pressure, and 73.0% were unaware of their most recent blood pressure reading. Medication adherence was suboptimal, with forgetfulness (32.0%) and disrupted routines (18.0%) cited as primary reasons. **Conclusion:** This study identified a disconnect between general hypertension knowledge and personal disease understanding. Despite some knowledge, many patients lacked awareness of their diagnosis and blood pressure control. Additionally, medication adherence was low. These findings highlight the need for targeted interventions to address knowledge gaps and adherence barriers, ultimately improving blood pressure control.

Keywords: Hypertension, Knowledge, Awareness, Medication Adherence, Blood Pressure Control

Introduction

Hypertension, or high blood pressure, is a major public health burden worldwide. It is a leading risk factor for stroke, heart disease, kidney disease, and other serious health problems [1]. In developing countries, there is a need to increase knowledge and awareness of hypertension, as well as improve detection, treatment, and control of the condition. This is especially important given the aging population, urbanization, and sedentary lifestyles that are increasing the prevalence of hypertension in these countries [2].

This study aimed to assess knowledge and awareness of hypertension, as well as adherence to anti-hypertensive medication among hypertensive patients attending a tertiary care teaching hospital in North India.

Methods

Study design: This was a cross-sectional, descriptive, comparative study.

Study area: The study was conducted at a tertiary care teaching hospital in North India.

Study setting: Hypertensive patients attending the outpatient department (OPD) of the hospital were included in the study.

Sample size: 1000 patients were recruited from the OPD.

Sampling method: Eligible respondents were selected using systematic randomized controlled sampling.

Study period: The study was conducted from April 2021 to October 2022.

Ethics: Ethical clearance was obtained from the hospital's ethics committee. After obtaining proper approval, three hundred and three patients were included in the study with their informed written consent. Subjects were interviewed to gather clinical and demographic data.

High Blood Pressure Study: Diagnosing and Managing the Silent Killer

This study delved into diagnosing and managing high blood pressure, a condition often lacking symptoms yet posing serious health risks. Here's a breakdown of the key methods used:

Diagnosing High Blood Pressure:

The standard for diagnosing high blood pressure involved taking blood pressure readings on two separate occasions using a mercury sphygmomanometer (a blood pressure cuff). If both systolic (pressure during heartbeats) and/or diastolic (pressure between heartbeats) readings were consistently above 140 mmHg and 90 mmHg respectively, it indicated hypertension.

Selecting Study Participants:

The study recruited 1,000 adult patients (both men and women) already diagnosed with high blood pressure. Participants with readings exceeding the pre-defined thresholds and who willingly agreed to participate were included. To ensure accurate results, pregnant women, individuals under 18, and those with mental incapacities were excluded.

Understanding Patient Knowledge:

A unique tool called the Hypertension Fact Questionnaire was developed specifically for this study. This bilingual questionnaire (English and Hindi) was built upon a foundation of research and insights from practicing physicians and cardiologists. It aimed to provide a comprehensive understanding of how well patients understood and were aware of their condition.

Assessing Medication Adherence:

The study employed the Morisky Medication Adherence Scale (MMAS) to evaluate how well patients stuck to their medication regimen. This eight-question survey utilized a five-point scale and open-ended questions to identify any challenges patients faced in adhering to their medication schedule. Scores ranged from 1 to 8, with higher scores indicating poorer adherence. Following established research using the MMAS, a score below 6 categorized a participant as non-adherent. This combined approach offered valuable insights into both the prevalence and specific reasons why patients might not be taking their medications as prescribed.

Data Analysis

Data were entered in Microsoft Excel sheet and were analyzed using SPSS (version 28.0.1.1) analytical package. Baseline results were presented as counts and percentages and as mean \pm SD for continuous variables. A will be considered significant.

Results

The basic demographic and pattern of risk factors associated with hypertension were shown in Table 1.

Table 1: Demographic and Risk Profile of Hypertension Patients.

Selected variables	Numbers	Percentage
Gender	-	-
Male	520	52.0 %
Female	480	48.0 %
Age (years)	-	-
30-39	100	10.0 %
40-49	200	20.0 %
50-59	250	25.0 %
60-70	300	30.0 %
??	150	15.0 %
Body mass index, kg/m²	-	-
Normal	300	30.0 %
Overweight	450	45.0 %
Obese	250	25.0 %
Alcohol consumption (mL/d)	-	-
Nondrinkers (0 or occasional)	600	60.0 %
Moderate drinkers (1-100)	250	25.0 %
Heavy drinkers (>100)	150	15.0 %
Reported level of exercise, score	-	-
Low	600	60.0 %
Intermediate	250	25.0 %
High	150	15.0 %
Smoking (cigarettes/d)	-	-
Nonsmokers (0)	700	70.0 %
Smokers (>1)	300	30.0 %
Serum total cholesterol (mmol/L)	-	-
Normal (5.2)	300	30.0 %
Borderline (5.2-6.5)	450	45.0 %
High (>6.5)	250	25.0 %

Knowledge and Awareness of Hypertension among Patients

The knowledge and awareness of hypertension were assessed among 1000 hypertensive patients using validated questionnaires. Results are presented in Tables 2 and 3. While 78.3% of patients demonstrated adequate knowledge about various aspects of hypertension, such as risk factors and complications, 21.7% had limitations in their understanding. Despite this knowledge, nearly half (49.3%) were unaware of their own diagnosis, and over two-thirds (67.2%) lacked knowledge of their target blood pressure goals. Additionally, more than a third (33.6%) did not recall their recent blood pressure readings.

On the positive side, over 80% of patients correctly identified hypertension as a chronic condition requiring ongoing management, and nearly all (99%) recognized the importance of medication adherence. Additionally, 62.4% understood the role of lifestyle changes in managing the condition, and a promising 69% reported improved blood pressure control within the past year. These findings suggest potential to empower patients through targeted interventions that bridge the knowledge-awareness gap and promote self-management behaviors.

Table 2: Understanding Hypertension: Patient Perspectives

Questions	Yes	No	Yes (%)	No (%)
Normal blood pressure values are typically around 120/80 mmHg.	700	300	70.0 %	30.0 %
Hypertension is diagnosed when blood pressure exceeds 140/90 mmHg.	720	280	72.0 %	28.0 %
Hypertension may progress with age.	680	320	68.0 %	32.0 %
Both genders may have an equal likelihood of developing hypertension.	500	500	50.0 %	50.0 %
Treatment options are available for managing hypertension.	780	220	78.0 %	22.0 %
A family history of hypertension can increase the risk.	550	450	55.0 %	45.0 %
Advancing age may pose a higher risk of hypertension.	720	280	72.0 %	28.0 %
Smoking is a known risk factor for hypertension.	730	270	73.0 %	27.0 %
Fatty foods can contribute to the risk of hypertension.	800	200	80.0 %	20.0 %
Being overweight is associated with an increased risk of hypertension.	750	250	75.0 %	25.0 %
Regular physical exercise can help reduce hypertension.	650	350	65.0 %	35.0 %
Excessive salt consumption may elevate blood pressure.	720	280	72.0 %	28.0 %

Medication is often used to control hypertension.	680	320	68.0 %	32.0 %
Hypertension can lead to life-threatening complications.	790	210	79.0 %	21.0 %

Table 3: Awareness Levels in Hypertensive Patients

Questions	Yes	No	Yes (%)	No (%)
Awareness of one's hypertension status.	860	140	86.0 %	14.0 %
Understanding the significance of blood pressure values in diagnosing hypertension.	380	620	38.0 %	62.0 %
Awareness of target personal blood pressure values for optimal health.	430	570	43.0 %	57.0 %
Recognizing that controlling blood pressure can reduce complications.	500	500	50.0 %	50.0 %
Understanding the risks of organ damage associated with uncontrolled hypertension.	450	550	45.0 %	55.0 %
Awareness of recent blood pressure values from clinic visits.	270	730	27.0 %	73.0 %
Perception regarding the curability of hypertension.	940	60	94.0 %	6.0 %
Recognizing the role of lifestyle changes in lowering blood pressure.	624	376	62.4 %	37.6 %
Noting improvements in blood pressure levels over the past year.	690	310	69.0 %	31.0 %

Adherence and Reasons for Non-adherence

All patients were interviewed about their drug adherence and possible reasons for non-adherence. The questionnaire contains eight questions, of which seven are yes or no type questions and the eighth one is a multiple-choice question. The drug adherence of the patients was shown in Table 4. These patients were asked to understand their reason for non-adherence to the treatment for hypertension. There were 15 universal reasons that were included in the questionnaire and responses were shown in Table 5. Almost all patients (99%) thought that taking medicine plays a key role in controlling the blood pressure. But most patients (84.5%) had poor drug compliance. The most common reasons for non-adherence were forgetfulness (70, 23.1%) and interruptions of daily routine (53, 17.5%).

Table 4: Medication Adherence Patterns in Hypertension Management

Questions	Yes	No	Yes (%)	No (%)
Do you sometimes find yourself forgetting to take your medication?	450	550	45.0 %	55.0 %
Have there been any days in the past two weeks when you missed taking your medication, aside from instances of forgetfulness?	300	700	30.0 %	70.0 %
Have you ever stopped or resumed taking your medication without informing your doctor?	200	800	20.0 %	80.0 %
Do you often forget to take your medication when you leave or travel from home?	320	680	32.0 %	68.0 %
Did you remember to take your medication yesterday?	450	550	45.0 %	55.0 %
Do you sometimes stop taking your medication when you feel your health is under control?	200	800	20.0 %	80.0 %
Do you ever feel hesitant or find it challenging to stick to your treatment plan by taking tablets every day?	180	820	18.0 %	82.0 %
How frequently do you encounter difficulty in remembering to take all your prescribed medication?				
Never/rarely—4	350	650	35.0 %	65.0 %
Once a while—3	300	700	30.0 %	70.0 %
Sometimes—2	150	850	15.0 %	85.0 %
Never—1	200	800	20.0 %	80.0 %

Table 5: Identifying Barriers to Medication Adherence in Hypertension

Reasons	Numbers	(%)
Limited understanding of the illness and disregard for long-term treatment.	120	12.0 %
Influence of religious beliefs and cultural customs on medication adherence.	80	8.0 %
Experiencing adverse reactions to prescribed drugs.	70	7.0 %
Patient skepticism regarding the effectiveness of medication in maintaining health.	60	6.0 %
Anxiety or apprehension related to medication intake.	90	9.0 %
Forgetfulness leading to missed doses of medication.	180	18.0 %
Unavailability of prescribed medication due to supply shortages.	60	6.0 %
Challenges stemming from inadequate communication and insufficient patient education.	100	10.0 %
Financial constraints including expenses related to doctors' fees, transportation, medication, and hospitalization.	130	13.0 %
Disruptions to daily routines affecting medication adherence.	150	15.0 %
Absence of reminders to take medication as prescribed.	100	10.0 %

Juggling medication schedules amidst busy work schedules or lateness.	110	11.0 %
Difficulty adhering to medication regimen while away for weekends or vacations.	70	7.0 %
Struggling to manage multiple medications concurrently.	90	9.0 %

Discussion

Hypertension's rising prevalence and link to cardiovascular problems make it a critical public health concern. Effective management hinges on patients' knowledge and awareness. This cross-sectional study assessed hypertension knowledge, awareness, and medication adherence within a specific community's hypertensive population.

Public awareness campaigns like the 1972 National High Blood Pressure Education Program have achieved some success [5]. Studies like NHANES II and III documented a BP awareness increase from 51% to 73% between 1976 and 1991 [6]. However, other research has identified knowledge and awareness gaps among both the general public [7] and hypertensive individuals [8].

Our findings showed that while most patients (72.0%) had a decent understanding of hypertension itself, specific areas revealed concerning knowledge gaps. Notably, although nearly all patients (86.0%) were aware of their diagnosis, a significant portion (40.0%) remained unaware of their current disease status. This discrepancy aligns with NHANES III data suggesting increased BP awareness but not necessarily a deeper comprehension. Recent reports emphasize the connection between hypertension knowledge and blood pressure control. Since systolic blood pressure (SBP) is a strong risk factor for cardiovascular disease, understanding its importance is crucial. However, our findings indicate a worrying lack of awareness: 62.0% of patients were unaware of their SBP at diagnosis, and 73.0% remained unaware at their last visit. Among those who knew their recent SBP, half (50.0%) mistakenly believed their control was satisfactory. These results highlight a clear need for healthcare providers, especially physicians, to educate patients about the significance of elevated SBP and its association with cardiovascular risk.

Furthermore, many patients struggled to recall their BP values (38.0% at diagnosis, 27.0% at last visit). Notably, even those who reported knowledge (43.0% and 38.0% respectively) often misclassified their blood pressure levels. This suggests a disconnect between patients' perception and actual readings, except for those with controlled BP. Additionally, 45.0% inaccurately believed their values were normal despite elevated readings. These findings underscore the critical need for improved hypertension education to enhance medication adherence and achieve optimal blood pressure control.

Applying Farquhar's model of behavioral change, our data suggests that while most patients possess general knowledge, only a few demonstrate true motivation (desire and action) to modify their

behavior. Few patients were observed to have reached the skills and action stages, where individuals actively engage in new behaviors. This points to an opportunity to leverage patient-reported sources for disseminating hypertension information effectively. In this study, patients identified physicians, other healthcare providers, mass media, print materials, and videos as valuable sources for improving knowledge and awareness.

Hypertension presents a significant opportunity for intervention due to its amenability to control through both lifestyle modifications and medications. Pharmacological treatments have demonstrably decreased blood pressure and cardiovascular events. Non-pharmacological interventions, such as smoking cessation, moderate alcohol consumption, salt restriction, regular exercise, healthy eating, and weight loss, also play a pivotal role in reducing medication needs and preventing hypertension onset in the general population. These interventions necessitate understanding individual perceptions, attitudes, beliefs, and outcome expectations, as emphasized by various models of health behavior and sustained change.

Poor medication adherence is a common challenge in clinical practice and a major barrier to effective hypertension management. Our study revealed poor adherence in most patients (45.0%), with forgetfulness and disruptions in daily routines cited as primary reasons. These findings highlight the need for optimizing hypertension prevention and control programs to minimize delays in achieving optimal blood pressure control, especially in countries experiencing a recent surge in hypertension prevalence.

While this study provides valuable insights for a specific patient population, it is important to acknowledge that the results may not necessarily reflect the reality of the broader Indian population.

Conclusion

The study identified a gap between patients' general knowledge of hypertension and their understanding of their specific condition and blood pressure readings. Medication adherence was also found to be low. These findings emphasize the need for improved patient education and communication strategies to enhance hypertension management.