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# Knowledge, Awareness, and Medication Adherence among Hypertensive Patients in Odisha: A Cross-Sectional Study

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## ABSTRACT

**Background:** India is undergoing an epidemiological transition with a growing burden of non-communicable diseases (NCDs), particularly hypertension. Approximately 30% of the Indian population is affected by hypertension, contributing significantly to premature mortality. This study aims to assess the knowledge, awareness, and medication adherence among hypertensive patients in Odisha, a state experiencing a rising prevalence of hypertension.

**Methods:** In a cross-sectional descriptive study, a total of 260 hypertensive patients aged over 18, on treatment for at least three months, were included. Participants were assessed for their knowledge and awareness of hypertension through a structured questionnaire, and medication adherence was evaluated using the Hill-Bone scale. Sociodemographic data, including age, gender, income, and duration of illness, were collected. Data were analyzed using appropriate statistical methods ($p<0.05$).

**Results:** Most participants were aged between 60 and 80 years, with more females (54.6%) affected than males (45.4%). Most participants had secondary education, and a significant portion hailed from rural areas. Regarding hypertension knowledge, 60.7% were aware of normal blood pressure levels, but only 38.4% recognized hypertension thresholds. While 76.9% understood the age-related increase in blood pressure, only 45.7% identified smoking as a risk factor. Regarding awareness, 71.9% knew they had hypertension, but 70% were unaware of their target blood pressure values. Medication adherence was poor, with forgetfulness being the primary reason for nonadherence (66.5%).

**Conclusion:** The study indicates a relatively good level of knowledge and awareness regarding hypertension among hypertensive patients in Odisha, though adherence to medication remains a challenge. Strengthening primary healthcare services, along with targeted awareness programs, can significantly improve hypertension management and patient outcomes.

**Key-words:** Hypertension, Knowledge, Awareness, Medication Adherence, Rural Health, Non-communicable Diseases, India, Cross-sectional Study, Patient Education

## INTRODUCTION

India is undergoing an epidemiological transition, grappling with the burden of both communicable and non-communicable diseases (NCDs) as it shifts towards an era dominated by NCDs.

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Hypertension has emerged as a significant epidemic in India and globally, being a leading cause of premature deaths. Studies indicate that approximately 30% of the Indian population is affected by hypertension, contributing to 10% of deaths. Projections suggest that the number of hypertensive individuals in India will increase from 118 million in 2000 to 213.5 million by 2025. This rapid rise in cases positions India as a potential global hotspot for hypertension, like its status as the diabetes capital of the world.

The World Health Organization (WHO) defines "adherence" as the extent to which an individual's behavior in taking medication, following a diet, and

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implementing lifestyle changes aligns with the recommendations of healthcare providers [1-3]. Nonadherence occurs when individuals fail to follow these prescribed recommendations. In low- and middle-income countries, including India, nonadherence rates are notably high, ranging from 27% to 70% among hypertensive patients [4,5]. Studies show that only 10.7% of rural and 20.2% of urban hypertensive patients in India have their blood pressure under control. Awareness about the disease significantly influences medication adherence, as informed patients are more likely to comply with treatment regimens. Poor compliance, often due to a lack of awareness, is a major reason for treatment failure. One study reported that 84.5% of patients exhibited poor medication compliance [6,7].

Cultural beliefs and practices influence community knowledge and awareness about diseases, necessitating localized studies to assess these factors. Researching hypertension knowledge, awareness, and medication adherence within specific communities can provide valuable data to inform health interventions.

## MATERIALS AND METHODS

This was a cross-sectional descriptive study conducted at a tertiary care institute in SCB Medical College and Hospital in Odisha. The study included hypertensive patients attending general medicine clinics at the institute, which caters to a diverse population from across Odisha. Participants were selected using a systematic randomized controlled sampling method. The study was conducted over six months.

**Research Design-** Hypertension was diagnosed with systolic blood pressure (SBP) and diastolic blood pressure (DBP) values over 140/90 mmHg, measured using a standard mercury sphygmomanometer on at least two occasions. The questionnaire assessed knowledge and awareness about hypertension among patients, comprising 14 questions on knowledge and nine on awareness. The NIH-developed scale evaluates self-reported medication adherence and is used globally. Sociodemographic data, including age, gender, income, illness duration, and treatment duration, were recorded. Data were analyzed using statistical methods, with significant results set at $p<0.05$.

**Inclusion criteria-** The study included 260 diagnosed hypertensive adults over 18 years, on treatment for at least three months.

**Exclusion criteria-** Exclusion criteria included pregnant individuals, those under 18, individuals with mental health conditions affecting comprehension, and patients with acute conditions like myocardial infarction, stroke, or acute renal failure.

**Statistical Analysis-** Data were analyzed using descriptive and inferential statistics, including t-tests, ANOVA, and regression analyses. Normality was assessed with the Shapiro-Wilk test, and non-parametric tests were used when assumptions were violated. Significance was set at $p<0.05$ with 95% confidence intervals. Analyses were performed using SPSS.

## RESULTS

**Sociodemographic Profile-** A total of 260 hypertensive individuals participated in the study, with the majority falling within the age range of 60-80 years. There was a higher prevalence of hypertension among females (142, 54.6%) compared to males (118, 45.4%). Most participants hailed from rural areas. Regarding education, the highest level attained by most participants was secondary education, with 72 (27.7%) having completed it, while only 23 (8.8%) were university graduates.

**Knowledge of Hypertension-** When assessing participants' knowledge, 158 (60.7%) were aware of normal blood pressure levels, but only 100 (38.4%) knew the thresholds for hypertension. A significant portion (200, 76.9%) understood that blood pressure increases with age, although 176 (67.6%) were unaware of gender differences in hypertension prevalence. Approximately 145 (55.7%) recognized that hypertension could be treated, and 152 (58.4%) believed that medication was the sole treatment. Furthermore, 234 (90%) acknowledged the role of physical activity in managing hypertension, and 128 (49.2%) were aware of potential complications associated with untreated hypertension. Awareness about risk factors, such as salt intake (225, 86.5%), obesity (223, 85.7%), and dietary habits (222, 85.3%), was high, while only 119 (45.7%) identified smoking as a risk factor.

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**Awareness Regarding Hypertension**- In terms of awareness about their condition, 187 (71.9%) participants were aware that they had hypertension. However, 182 (70%) were unaware of their target blood pressure values. About 154 (59.2%) knew that controlling hypertension could prevent complications, while 166 (63.8%) were unaware of their most recent blood pressure measurements. Additionally, 140 (53.8%) did not know their blood pressure trends over the past year.

**Adherence to Drug Therapy**- Medication adherence was evaluated using the widely used Hill-Bone scale, a 14-question tool designed to assess adherence to prescribed medications.

**Reasons for Nonadherence to Therapy**- When exploring reasons for nonadherence, most participants did not skip medications due to cultural beliefs (249, 95.7%), adverse drug reactions (256, 98.4%), vacations (239, 91.9%), or many medications (230, 90.1%). The most common reason for nonadherence was forgetfulness (173, 66.5%) or the lack of reminders. Factors such as medication cost, poor information or communication, and issues with drug availability did not significantly impact adherence.

**Correlations Between Knowledge, Awareness, and Adherence**- A bivariate analysis revealed that both knowledge and awareness scores had a positive correlation with age (Table 1).

**Table 1:** Comparing knowledge, awareness, and adherence regarding hypertension

| Variable | p-value |
|---|---|
| Age and knowledge score correlation | 0.22 |
| Age and awareness score correlation | 0.32 |
| Education and knowledge score | 0.001 |
| Education and awareness score | 0.001 |
| Education and medication adherence | 0.001 |
| Occupation and knowledge score | 0.001 |
| Occupation and awareness score | 0.001 |
| Occupation and medication adherence | 0.001 |
| Place of residence and knowledge score | 0.001 |
| Place of residence and awareness score | 0.001 |
| Place of residence and medication adherence | 0.001 |

Additionally, there were positive associations between levels of knowledge, awareness, and medication adherence across different educational levels, occupations, and places of residence. This indicates that these factors may influence a patient's understanding and management of hypertension.

## DISCUSSION

This study explored the knowledge, awareness, and adherence to drug therapy among hypertensive patients in our local region, along with the reasons for nonadherence. Most participants were aged between 61 and 70 years, with the fewest under 30 years. Globally, women generally have a slightly higher prevalence of hypertension compared to men; our study similarly found a slightly higher prevalence in women [8-10]. Most participants were from rural areas. Regarding education, 28.7% had secondary education, while 27.3% were illiterate, likely reflecting the limited educational opportunities available to the older population. The largest occupational group was semi-skilled workers, with 23% unemployed, which may relate to the lower literacy rates. A significant number of respondents had never consumed alcohol (85.7%), used tobacco (97%), or smoked (97.7%).

Various studies have reported differing results concerning alcohol consumption and smoking. The Cardiological Society of India (CSI) found a 38% prevalence of hypertension among beer consumers compared to controls [11]. However, a study in Chennai found no significant link between alcohol consumption and hypertension [12]. Smoking is known to cause vasoconstriction and an abrupt rise in blood pressure, but its long-term effects on hypertension are not well-documented [13]. Most patients (83.7%) were vegetarians, with 14.7% following a mixed diet. Normal salt intake was reported by 97.7%, indicating generally good dietary habits and minimal addiction.

The knowledge regarding hypertension among our patients was relatively good, contrasting with other Indian studies that reported poor knowledge among hypertensive patients [14]. In terms of drug adherence, many participants reported occasionally forgetting to take their medications, never taking others' medications, and consistently scheduling follow-up appointments. However, it was noted that many patients do not take their medications on the day of their hospital visit, an

issue that needs to be addressed through patient education. Forgetfulness was the main reason for nonadherence, although cost did not hinder medication intake, as most patients were well-informed about their treatment [15].

These results indicate that, despite most patients coming from rural areas with lower literacy rates, their knowledge about hypertension, dietary habits, and healthy lifestyle practices is commendable. This may be attributed to government programs on NCD awareness. The influx of rural patients underscores the urgent need to strengthen primary and secondary healthcare services, allowing patients to be managed at these levels. The provision of free medications at government hospitals has also positively impacted adherence [15].

## CONCLUSIONS

The study revealed an acceptable level of knowledge regarding hypertension among the patients. There is a pressing need to bolster primary and secondary healthcare services to manage patients more effectively at these levels. Additionally, initiating more awareness programs can help prevent complications associated with hypertension.

## CONTRIBUTION OF AUTHORS

**Research concept-** Ramchandwani S, MickeyAR
**Research design-** Mishra S, Mohapatra J
**Supervision-** Mishra S, Mohapatra J
**Materials-** Ramchandwani S, MickeyAR
**Data collection-**Ramchandwani S, MickeyAR
**Data analysis and Interpretation-** Mishra S, Mohapatra J
**Literature search-** Ramchandwani S, MickeyAR
**Writing article-** Ramchandwani S, MickeyAR
**Critical review-** Mishra S, Mohapatra J
**Article editing-** Ramchandwani S, MickeyAR
**Final approval-** Mishra S, Mohapatra J

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