

Factors Affecting Medication Adherence among Adult Hypertensive Patients Attending a Tertiary Care Hospital: An Observational Study

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Abstract

Background: Hypertension remains a major global health concern and a leading risk factor for cardiovascular morbidity and mortality. Despite availability of effective antihypertensive therapies, poor medication adherence continues to compromise disease control, especially in developing countries like India.

Aim: To evaluate socio-demographic, behavioural, and clinical factors influencing medication adherence among adult hypertensive patients attending a tertiary care hospital.

Methods: A hospital-based cross-sectional observational study was conducted among 106 adult hypertensive patients attending the outpatient department. Data were collected using a semi-structured questionnaire. Medication adherence was assessed using the Hill-Bone Medication Adherence Scale. Statistical analysis included descriptive statistics, chi-square test, and multivariable logistic regression. A p-value <0.05 was considered statistically significant.

Results: Overall adherence was observed in 65.1% of patients. Smoking (p=0.001), diabetes mellitus (p=0.026), and drug regimen (p=0.038) showed significant associations with adherence. Logistic regression revealed smoking (AOR=6.27, p=0.012) and diabetes (AOR=3.24, p=0.037) as major predictors of non-adherence. Occupation also significantly influenced adherence, with farmers showing the highest non-adherence (AOR=40.0, p=0.005).

Conclusion: Behavioural and clinical factors have a stronger impact on medication adherence than socio-demographic variables. Targeted interventions addressing modifiable risk factors can improve adherence and hypertension outcomes.

Keywords: Global health, Hypertension, Tertiary care hospital.

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Introduction

Hypertension is a chronic, non-communicable disease characterized by persistently elevated arterial blood pressure and is widely recognized as a “silent killer” due to its asymptomatic nature in early stages. It significantly contributes to cardiovascular diseases, stroke, renal failure, and premature mortality worldwide [1]. According to recent global estimates, hypertension accounts for approximately 10.8 million deaths annually, making it one of the leading modifiable risk factors for morbidity and mortality [2].

In India, the burden of hypertension has been rising steadily, with more than 200 million individuals affected [3]. Rapid urbanization, sedentary lifestyles, dietary transitions, and increasing life expectancy have contributed to this epidemiological shift. Despite increased awareness and availability of antihypertensive medications,

optimal blood pressure control remains suboptimal, largely due to poor medication adherence [4]. Medication adherence refers to the extent to which patients take medications as prescribed by their healthcare providers. It is a critical determinant of therapeutic success in chronic diseases like hypertension [5]. Non-adherence can lead to uncontrolled blood pressure, increased risk of complications, higher healthcare costs, and increased hospitalizations [6]. Studies suggest that nearly 30–50% of patients with hypertension do not adhere adequately to prescribed treatment regimens [7].

Multiple factors influence medication adherence, broadly categorized into socio-demographic, clinical, behavioural, and healthcare system-related factors. Socio-demographic factors such as age, gender, education, and income have shown variable

associations with adherence across studies [8]. Behavioural factors such as smoking, alcohol consumption, and lifestyle habits significantly impact adherence patterns [9]. Clinical factors including presence of comorbidities, duration of illness, and complexity of drug regimens also play a crucial role [10].

In addition, patient-related factors such as health literacy, beliefs about medications, and understanding of disease severity influence adherence [11]. The type of antihypertensive medication and its side effect profile may also affect patient compliance [12]. Furthermore, accessibility to healthcare facilities and patient-physician communication are important determinants of adherence [13].

The Hill-Bone Medication Adherence Scale is a validated tool commonly used to assess adherence in hypertensive patients. It evaluates behaviours related to medication-taking, appointment-keeping, and dietary practices [14]. Identifying determinants of adherence using such tools can help in designing targeted interventions.

Given the multifactorial nature of medication adherence and the limited data from rural tertiary care settings in India, this study aims to evaluate the various socio-demographic, behavioural, and clinical factors influencing adherence among hypertensive patients.

Understanding these factors is essential for improving treatment outcomes and reducing the burden of hypertension-related complications.

Materials and Methodology

This study was conducted as a hospital-based observational cross-sectional study in the outpatient department of Shaheed Hasan Khan Mewati Government Medical College Medical College in Haryana, India. Ethical approval was obtained from the Institutional Ethics Committee prior to commencement.

Study Design and Population

Ethical Approval

- The study protocol was reviewed and approved by the Institutional Ethics Committee (IEC) of SHKM Government Medical College, Nalhar.
- Ethical clearance ensured that the study adhered to the principles of the Declaration of Helsinki.
- Written informed consent was obtained from all participants prior to inclusion in the study.

Study Design

- The present study was designed as a hospital-based observational cross-sectional study.

- Being observational in nature, no intervention or alteration in the patient's treatment regimen was made.
- A cross-sectional approach was used to assess medication adherence and its associated factors at a single point in time.

Study Setting

- The study was conducted in the Outpatient Department (OPD) of SHKM Government Medical College, Nalhar, and Haryana.
- This tertiary care teaching hospital caters to a large rural and semi-urban population, providing a diverse patient base.
- Patients attending the medicine OPD for routine follow-up or treatment of hypertension were screened for eligibility.
- The setting allowed easy accessibility to diagnosed hypertensive patients and ensured adequate sample recruitment.

Study Population

- The study population consisted of 106 adult patients diagnosed with essential hypertension.
- Only those patients who were already on oral antihypertensive medications were included.
- Patients were recruited irrespective of gender, socioeconomic status, or duration of disease.
- The population represented a mix of rural and semi-urban individuals, reflecting real-world clinical scenarios.

Sample Size

- A total of 106 patients were included in the study.
- The sample size was determined based on feasibility, patient flow in the OPD, and study duration.

Sampling Technique

- A consecutive sampling method was used.
- Patients meeting the inclusion criteria were recruited sequentially until the desired sample size was achieved.

Inclusion Criteria

- Age ≥ 18 years
- Diagnosed cases of hypertension
- On antihypertensive treatment

Exclusion Criteria

- Secondary hypertension
- Pregnant women
- Severely ill patients unable to respond

Data Collection

Data were collected using a pre-validated semi-structured questionnaire including:

- Socio-demographic details

- Clinical history
- Behavioural factors
- Drug regimen

Assessment of Adherence: Medication adherence was assessed using the Hill-Bone Medication Adherence Scale, which evaluates patient compliance across multiple domains.

Statistical Analysis

- Data analyzed using statistical software

- Descriptive statistics (mean, percentage)
- Chi-square test for associations
- Logistic regression for predictors
- $p < 0.05$ considered statistically significant

Results

A total of 106 adult hypertensive patients were included in the present study. The analysis focused on socio-demographic characteristics, clinical and behavioural variables, and their association with medication adherence.

Table 1: Socio-demographic Profile of Participants (n=106)

Variable	Category	Frequency	Percentage
Age	<55 years	57	53.8%
	≥55 years	49	46.2%
Gender	Male	53	50.0%
	Female	53	50.0%
Education	Illiterate	28	26.4%
	Graduate	22	20.7%
Occupation	Farmer	33	31.1%
	Housewives	35	33.0%

The study population showed a slightly higher proportion of younger individuals (<55 years: 53.8%) with an equal gender distribution (50% males and females). A considerable number of

participants were illiterate (26.4%), while graduates constituted 20.7%. The majority were engaged in agriculture (31.1%) and household work (33.0%), reflecting a predominantly rural background.

Table 2: Association of Variables with Medication Adherence

Variable	Adherence (%)	p-value
Age (<55 vs ≥55)	71.9% vs 54.8%	0.071
Gender	58.5% vs 71.7%	0.154
Occupation	48.5%–90.9%	0.051
Education	Variable	0.626
Smoking	36.4% vs 72.6%	0.001
Diabetes	52.4% vs 73.4%	0.026
Drug Type	Significant difference	0.038

- Smoking showed a highly significant negative association with adherence ($p=0.001$).
- Diabetic patients had significantly lower adherence ($p=0.026$).
- Drug regimen influenced adherence significantly ($p=0.038$).
- Age and occupation showed borderline significance.
- Gender and education were not statistically significant.

Table 3: Logistic Regression Analysis of Non-Adherence

Variable	Adjusted Odds Ratio (AOR)	p-value
Smoking	6.27	0.012
Diabetes	3.24	0.037
Farmers	40.0	0.005
Maids	100.0	0.029
Education (Graduate)	0.17	0.045

Multivariable analysis identified smoking and diabetes as independent predictors of non-adherence.

- Smokers had 6.27 times higher odds of non-adherence ($p=0.012$).

- Diabetics had 3.24 times higher odds ($p=0.037$).
- Occupational groups such as farmers and maids showed markedly higher risk.

- Higher education (AOR=0.17) significantly reduced the likelihood of non-adherence, acting as a protective factor.

Overall Findings

- Adherence rate: 65.1%
- Non-adherence: 34.9%
- Behavioural and clinical factors had stronger influence than socio-demographic variables.

Discussion

The present study highlights the multifactorial determinants of medication adherence among hypertensive patients in a tertiary care setting. The observed adherence rate of 65.1% is comparable to previous Indian studies reporting adherence between 50–70% [1,2].

Smoking emerged as the most significant predictor of non-adherence, consistent with findings from other studies [3,4]. Smokers often exhibit poor health-seeking behaviour and reduced compliance with long-term therapies. This suggests the need for integrating smoking cessation programs with hypertension management.

Diabetes mellitus was another significant factor associated with poor adherence. Patients with multiple comorbidities often face higher pill burden and treatment fatigue, leading to reduced compliance (5). Similar findings have been reported in previous literature [6].

Occupation showed a strong association, particularly among farmers, who demonstrated higher non-adherence. This may be attributed to irregular work schedules, lack of access to healthcare, and lower health awareness [7]. Socioeconomic constraints and healthcare accessibility issues in rural populations further contribute to poor adherence.

Interestingly, education did not show a significant association in bivariate analysis but emerged as a protective factor in regression analysis. Educated patients are more likely to understand disease severity and importance of medication adherence [8].

The type of drug regimen also influenced adherence, with better adherence observed in patients on amlodipine compared to telmisartan. This could be related to dosing frequency, side effect profile, and cost factors [9].

Age and gender did not show significant associations, although younger patients tended to have better adherence. This may reflect better health awareness and fewer comorbidities among younger individuals [10].

The findings emphasize that behavioural and clinical factors outweigh socio-demographic

variables in determining adherence. Therefore, interventions should focus on modifiable risk factors such as smoking cessation, simplification of drug regimens, and patient education [11,12].

The study is limited by its cross-sectional design and relatively small sample size. Self-reported adherence may also introduce bias. However, the use of a validated scale strengthens the reliability of findings.

Conclusion

Medication adherence among hypertensive patients is influenced predominantly by behavioural and clinical factors rather than socio-demographic characteristics. Smoking, diabetes, and occupational factors significantly contribute to non-adherence, while education plays a protective role. Targeted interventions focusing on lifestyle modification, patient education, and individualized treatment strategies are essential to improve adherence and overall hypertension control.

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