

A cross-sectional study to assess the determinants of medication adherence among patients with hypertension attending the outpatient department of a tertiary care hospital in Ernakulam district, Kerala

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Abstract- Background: The high prevalence of hypertension, low rates of medication adherence, and the substantial gap in achieving blood pressure control, there was a critical need to explore the determinants of medication adherence among patients with hypertension in India.

Objectives: The objectives were to determine the level of medication adherence among patients with hypertension, to identify the determinants of medication adherence among patients with hypertension and to determine the association between medication adherence and selected socio demographic and clinical proforma.

Methods: A cross-sectional analytical study was conducted among 150 patients with hypertension attending the outpatient department of a tertiary care hospital in Ernakulam district, Kerala. A quantitative research approach was adopted, and participants were selected using a convenience sampling technique. A socio demographic and clinical proforma, Hill Bone HBP Compliance to high blood pressure therapy scale (HB-HBP) and a Self-structured questionnaire to assess the determinants of medication adherence in hypertensive patients were used to collect data. Statistical significance was considered at $p < 0.05$.

Results: In the study it shows that 75% patients have good adherence, 25% have average adherence and none of the patients have poor adherence. The various determinants such as patient knowledge, motivation, beliefs, financial affordability, access to care, social support, and treatment-related factors like side effects and medication dose changes were identified. The association is analyzed between level of medication adherence with selected socio demographic and clinical proforma which revealed significant association between level of adherence and selected socio-clinical factors like

educational qualification($p=0.036$), duration of hypertension treatment($p=0.002$), other related diseases like Diabetes mellitus($p=0.045$), coronary artery disease ($p=0.018$), CKD ($p=0.036$) and regular exercise.

Conclusion: To conclude, improving adherence to medication regimen aid in effective hypertension management and prevention of complications related to hypertension.

Keywords: Hypertension; Medication adherence; Determinants; Socio-demographic and clinical proforma;

I. INTRODUCTION

Hypertension is defined as a chronic medical condition characterized by a persistent elevation in arterial pressure in which systolic blood pressure values of 130 mm Hg or more and/or diastolic blood pressure of more than 80 mm Hg.¹ The various modifiable risk factors contributing to the increasing prevalence of hypertension includes physical inactivity, an unhealthy diet, obesity, excessive alcohol consumption, tobacco use, and chronic stress whereas the non-modifiable risk factors include age, family history, and certain chronic conditions. Many people with hypertension are unaware of their condition, and less than half are diagnosed and treated. However, with effective use of pharmacological and non-pharmacological methods, hypertension can be managed to an extent, aiding in prevention of other complications related to hypertension including heart

attack, stroke, heart failure, renal failure, atherosclerosis and other illness.²

Despite the availability of effective treatments, the control of blood pressure remains unsatisfactory, particularly in low- to middle-income countries. Medication non-adherence is a significant contributor to this issue. Adherence, in broad terms, is defined as the extent to which a person's behaviour such as taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider.³ Non adherence can be intentional or unintentional and is influenced by various factors, including patient beliefs, forgetfulness, understanding of the disease, side effects, cost of medication, health literacy, and the nature of the healthcare system.⁴

Several determinants influencing medication adherence among individuals with co-existing hypertension includes person-related factors such as forgetfulness and cognitive impairments (e.g., poor vision and memory) were negatively associated with adherence. Conversely, good family support, including financial assistance, was positively correlated with better adherence. Healthcare accessibility also plays a crucial role; where limited access to healthcare facilities hinder adherence. Medication-related factors like high costs and polypharmacy also contribute to non-adherence. Socio-demographic variables such as education level, knowledge about the conditions, and physical impairments were significantly associated with adherence behaviour.⁵

Understanding these factors within specific cultural and demographic contexts is crucial for effective blood pressure control, reducing non-communicable diseases, improving health outcomes, and guiding evidence-based strategies to enhance adherence, allocate resources efficiently, and achieve national health goals.

Objectives

- To determine the level of medication adherence among patients with hypertension.
- To identify the determinants of medication adherence among patients with hypertension.

- To determine the association between medication adherence and selected socio demographic and clinical proforma.

Hypothesis

H_{A1}: There is significant association between level of medication adherence among patients with hypertension and selected socio demographic and clinical variables.

H₀₁: There is no significant association between level of medication adherence among patients with hypertension and selected socio demographic and clinical variables.

II. MATERIALS AND METHODS

Research Approach: Quantitative research approach

Research design: Cross sectional analytical study design

Research variables: Level of medication adherence and determinants of medication adherence among patients with hypertension.

Setting of the study: The study was conducted in General medicine and Cardiology outpatient department M.O.S.C Medical mission hospital in Ernakulam district

Population: Patients aged 35 to 75 diagnosed with Hypertension for more than 6 months and on anti-hypertensive therapy in Ernakulam district.

Sample and sampling technique

Sample: Patients aged between 35-75yrs who were diagnosed with hypertension and on anti-hypertensive drug therapy for more than 6 months attending the General Medicine and Cardiology outpatient departments of M.O.S.C. Medical College Hospital, Kolenchery.

Sampling technique: The sampling technique used for the study was Convenience Sampling Technique

Sample size: The estimated sample size was 131.

Sample selection criteria:

Inclusion criteria:

- Adult patients aged between 35 to 75yrs diagnosed with hypertension and on antihypertensive therapy for at least 6 months.
- Patients attending the General medicine and Cardiology outpatient department.

Exclusion criteria:

- Patients with functional and cognitive impairment which incapacitates them to participate in the study.

III. DATA COLLECTION TOOLS

Data were collected using a Hill Bone HBP Compliance to high blood pressure therapy scale (HB-HBP), Socio demographic and clinical proforma, Self-structured questionnaire to assess the determinants of medication adherence in hypertensive patients

IV. RESULTS

The study finding revealed that 75% patients have good adherence, 25% have average adherence and none of the patients have poor adherence. The association is analysed between level of medication adherence with selected sociodemographic and clinical proforma revealed several statistically significant findings. Specifically, educational qualification ($\chi^2=10.256$, $p = 0.036$), duration of treatment for hypertension ($\chi^2=14.742$, $p = 0.0021$), other related diseases including Diabetes ($\chi^2=6.206$, $p = 0.045$), Coronary Artery Disease ($\chi^2=5.591$, $p = 0.018$), and Chronic Kidney Disease ($\chi^2=0.545$, $p = 0.036$), and regular exercise ($\chi^2=5.067$, $p = 0.024$) all demonstrated a statistically significant association with the level of medication adherence. This suggests that these factors play a role in influencing how consistently patients adhere to their antihypertensive regimens. In contrast, variables such as age ($\chi^2=1.150$, $p = 0.765$), gender ($\chi^2=1.837$, $p = 0.175$), religion ($\chi^2=2.086$, $p = 0.352$), place of residence ($\chi^2=1.605$, $p = 0.448$), occupation ($\chi^2=7.047$, $p = 0.217$), monthly income ($\chi^2=0.938$, $p = 0.816$), marital status ($\chi^2=6.929$, $p = 0.074$), family type ($\chi^2=5.926$, $p = 0.115$), number of medications currently prescribed for hypertension ($\chi^2=4.502$, $p = 0.212$), other related diseases like Stroke ($\chi^2=1.876$, $p = 0.391$),

Dyslipidemia ($\chi^2=0.047$, $p = 0.829$), and COPD/Asthma ($\chi^2=1.145$, $p = 0.285$), taking medications for chronic conditions ($\chi^2=3.020$, $p = 0.082$), hypertension management ($\chi^2=0.002$, $p = 0.999$), BMI ($\chi^2=3.795$, $p = 0.284$), alcohol consumption ($\chi^2=4.683$, $p = 0.197$), smoking ($\chi^2=4.227$, $p = 0.238$), and ability to perform self-care activities ($\chi^2=0.661$, $p = 0.416$) did not show a statistically significant association with medication adherence.

Major findings

The study finding revealed that 75% patients have good adherence, 25% have average adherence and none of the patients have poor adherence. The association is analysed between level of medication adherence with selected sociodemographic and clinical proforma which revealed significant association between level of adherence and selected socio-clinical factors like educational qualification($p=0.036$), duration of hypertension treatment($p=0.002$), other related diseases like Diabetes mellitus($p=0.045$), coronary artery disease ($p=0.018$), chronic kidney disease ($p=0.036$) and regular exercise.

V. DISCUSSION

The present study aimed to assess medication adherence, and determinants among patient with hypertension, and to explore the relationships between these variables in comparison to existing literature. The findings of the study are discussed under the following headings.

2.61. Description of the level of medication adherence among patients with hypertension.

2.62. Determinants of medication adherence among patients with hypertension.

2.63. Association between medication adherence and selected socio demographic and clinical proforma.

2.61. Description of the level of medication adherence among patients with hypertension.

The present study found that a majority of patients with hypertension exhibited good adherence (75%), followed by average adherence (25%), with no

patients demonstrating poor adherence (0%). This finding of high adherence is consistent with some research from India. For instance, a cross-sectional study by Varma et al. (2023) 39 in Hyderabad, India, reported a prevalence of good adherence to medication as 70.83% among hypertensive patients attending an urban health center, which closely supports the high adherence rate observed in our study. However, the high adherence rate in our study contrasts with findings from other studies in India and globally, which often report lower adherence or a more significant proportion of patients with poor adherence. For example, a study by Patel et al. (2025) 40 conducted in Ahmedabad, India, found that only 57% of hypertensive participants had high adherence, while 21.5% had moderate and 21.5% had low adherence, presenting a notably lower " good adherence " rate and a significant " low adherence " rate compared to our findings. Similarly, a systematic review and meta-analysis on adherence to antihypertensive medication in India by Kumar et al. (2024) 41 determined a pooled adherence rate of only 15.8%, indicating a much lower overall adherence compared to our study's results. These discrepancies highlight the variability in medication adherence rates across different regions and populations, possibly influenced by varying methodologies, definitions of adherence, and socio-economic contexts.

2.62: Determinants of medication adherence among patients with hypertension.

The findings of the present study on medication adherence among hypertensive patients in Ernakulam, Kerala, align with some aspects of existing literature while also presenting notable differences. Both our study and that by Jhaj et al. (2018) 42 , despite using different adherence scales, indicated a high proportion of patients with good medication adherence (75% in our study vs. 72.5% in Jhaj et al.), suggesting a generally favorable adherence profile in urban Indian outpatient settings. Regarding specific determinants, our finding of a statistically significant association between educational qualification ($p=0.036$) and medication adherence is supported by a systematic review and meta-analysis by Kumar et al. (2024) 41 , which identified low education levels as an important factor associated with non-adherence, implying that

higher education correlates with better adherence. Similarly, our finding of significant associations with specific comorbidities (Diabetes, CAD, CKD) is broadly supported by Kumar et al. (2024), who also noted comorbidities as a factor associated with non-adherence. However, several points of divergence emerged. Our study found no significant association between gender and medication adherence ($p=0.175$). This contradicts findings from a study by Badhe et al. (2020) 43 in Navi Mumbai, which reported adherence rates were significantly higher among females. Furthermore, while our study found a significant association with educational qualification (higher education linked to better adherence), Badhe et al. (2020) presented a contradictory finding, observing that adherence rates were significantly higher among individuals who had never attended school. Our study also identified a significant association with the duration of hypertension treatment ($p=0.002$) and regular exercise ($p=0.024$), factors which were either not consistently supported or explicitly analyzed in the provided abstract of Jhaj et al. (2018). Conversely, our non-significant findings for occupation and the number of medications prescribed align with observations from Jhaj et al. (2018). These discrepancies highlight the complex interplay of patient-related, treatment-related, and socio-demographic factors, emphasizing the importance of regional and contextual differences, as well as variations in study methodologies and specific definitions, when comparing research findings.

2.63. Association between medication adherence and selected sociodemographic and clinical proforma.

The present study identified several socio-demographic and clinical factors significantly associated with medication adherence among hypertensive patients, including educational qualification, duration of treatment, specific comorbidities (Diabetes, Coronary Artery Disease, Chronic Kidney Disease), and regular exercise. These findings resonate with, and at times diverge from, recent Indian literature. Our finding that educational qualification is significantly associated with medication adherence ($p=0.036$) is supported by a systematic review and meta-analysis by Kumar et al. (2024), which identified low education levels as an important factor associated with non-adherence

among Indian hypertensives, implying that higher education correlates with better adherence. Similarly, our observation of significant associations with comorbidities (Diabetes, CAD, CKD) aligns with Kumar et al. (2024), who also noted comorbidities as a significant factor influencing non-adherence. However, our study also presented findings that contradict some recent Indian research. For instance, our study found no significant association between gender ($p=0.175$) and medication adherence. This is in contrast to the findings of Badhe et al. (2020) from Navi Mumbai, which reported that adherence rates were significantly higher among females. Furthermore, while our study demonstrated a significant association between higher educational qualification and better adherence, Badhe et al. (2020) presented a contradictory result, observing that adherence rates were significantly higher among individuals who had never attended school. These discrepancies underscore the complex interplay of various factors and highlight the importance of regional and contextual differences, as well as variations in study methodologies and specific population characteristics, when interpreting and generalizing research findings on medication adherence.

VI. CONCLUSION

This study aimed to assess the level of medication adherence among patients with hypertension. Collected data were analyzed using EZR software. The study finding revealed that 75% patients have good adherence, 25% have average adherence and none of the patients have poor adherence. The various determinants such as patient knowledge, motivation, beliefs, financial affordability, access to care, social support, and treatment-related factors like side effects and medication dose changes were identified. The association is analyzed between level of medication adherence with selected socio demographic and clinical proforma. The study revealed significant association between level of adherence and selected socio-clinical factors like educational qualification, duration of treatment, other related diseases like DM, CAD, CKD and regular exercise. Thus, HA1 is accepted.

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CONFLICT OF INTEREST-

The author declares no conflict of interest in the study.

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