ADHERENCE TO ANTIHYPERTENSIVE MEDICATION AND ITS DETERMINANTS IN A PRIMARY CARE SETTING OF KALABURAGI DISTRICT

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ABSTRACT

Objectives: Hypertension is a chronic condition of concern and it is the most common non-communicable disorder posing a major public health challenge in many aspects. Adherence to prescribed medicine is a crucial issue that is directly related to the management of hypertension. To control high blood pressure and to avoid associated repercussions, good antihypertensive medication adherence is an effective strategy. The study aimed to estimate adherence to medication among hypertensive patients attending the non-communicable disease clinic at Urban Primary Health Centre (UPHC), Kalaburagi. To assess the determinants of adherence to antihypertensive medication.

Methods: A facility-based cross-sectional study was conducted among adult hypertensive patients receiving treatment from the UPHC. A semi-structured questionnaire and an 8-item Morisky medication adherence scale (MMAS-8) were used to assess the determinants and medication adherence status.

Results: Assessing the adherence level using the Morisky scale (MMAS-8), it was observed that 35 (38.9%) had low adherence, while 26 (28.9%) had medium adherence and 29 (32.2%) had high adherence.

Conclusion: The majority of study participants have poor adherence to antihypertensives. The adherence level can be further improved by providing health education and efficient counseling drug adherence assessment needs to be an integral component of routine care.

Keywords: Medication adherence, Non-communicable diseases, Antihypertensive drugs.

INTRODUCTION

Hypertension is a major burden and public health challenge to the population due to its role in the causation of coronary heart disease, stroke, and other vascular complications [1].

World Health Organization estimates that 1.28 billion adults aged 30–79 years worldwide have hypertension, among which two-thirds live in low- and middle-income countries like India. The prevalence of hypertension in India is estimated to be 45.3% [2,3].

The only effective way to manage hypertension is through strict medication adherence. Studies conducted globally have shown that even with the availability of efficient medical therapy, almost half of the hypertensives do not take any medication as prescribed [4]. Medication adherence is defined as "the extent to which a person's behaviour - taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider" [5].

Moriskys medication adherence scale (MMAS) is one of the tools used to measure the level of medication adherence [6]. The adherence levels are classified into high, medium, and low. In India, the level of adherence to antihypertensive medication is very low, which is an issue of concern.

The determinants of non-adherence to medication are irregular supply from government pharmacies, forgetfulness, and non-affordability. Other factors include age, low education, fear of side effects from medication, and inadequate instruction from medical professionals regarding the use of medications. These determinants play a major role in influencing medication adherence which is vital to achieve optimum blood pressure [7,8].

With these backdrops, this study was carried out to document the medication adherence and their determinants among patients treated for hypertension in urban clinical settings.

METHODS

This cross-sectional study was conducted among the hypertensive patients attending the non-communicable disease clinic of the primary health-care center, New Rehmat Nagar which is an urban field practice area of the department of community medicine, ESIC medical college- and hospital, Kalaburagi. The present study was conducted for 3 months. The study participants included hypertensive patients who were on anti-hypertensives for at least 6 months. The sample size of 90 was calculated by taking the percentage of patients taking medication for hypertension in Kalaburagi district as 31.8% (National Family Health Survey -5) [3] with a relative precision of 10% and 95% confidence interval.

The data were collected using a pretested semi-structured questionnaire after obtaining approval from the Institutional Ethics Committee of ESIC medical college and hospital, Kalaburagi. An 8-item MMAS MMAS-8 was used to assess the medication adherence status. Three levels of adherence were considered based on the following scores: 0 to <6 (low); 6 to <8 (medium); 8 (high). The study participants were assured about the confidentiality and anonymity of the information obtained. The collected data were entered in Microsoft excel and analyzed for frequency, percentage and Chi-square test. $p<0.05*$ was considered statistically significant. Written informed consent was obtained from those who were willing to participate in the study.

Ethical considerations
Approved (ESICMC/GLB/IEC/08/2024-2025).

RESULTS AND DISCUSSION

Description of study sample
The study involved a total of 90 participants. Nearly half of the subjects, 48 (53%), were aged between 18 and 59 years. The mean age of the participants was 56 years. The majority of the subjects were females, accounting for 63 (70%) of the total, while 27 (30%) were males. Among them, 72 (80%) were married, and the remaining 18 (20%) were widowed. Out of the 18 widowed individuals, 13 (72%) were living alone. Approximately 50% of the study population were illiterates, and 73% were unemployed. The majority of the participants, 66 (73.4%), were classified as belonging to the lower socioeconomic class according to the modified Kuppuswamy scale - 2023, followed by 13 (14.4%) and 11 (12.2%) in the middle and upper socioeconomic classes, respectively (Table 1).

Treatment and facility
Almost 66.7% of the individuals were found to have high blood pressure within the past 5 years. All of those diagnosed were started on medication for hypertension, and 84.4% of them were on monotherapy. Majority of the subjects, 83 (92%), sought treatment from a nearby government health facility, likely due to its close proximity (<5 km). However, only 50% of the study participants received advice on adherence to medication irrespective of the type of facility they visited.

Out of 90 participants, seven of them spent an average of Rs. 417/month for procuring drugs from private hospitals. Out-of-pocket costs were covered by the families of three patients and by four patients themselves among those seven individuals.

Family history of hypertension was presented in 42 (47%) of the participants and the majority of participants 63 (70%) perceived that their hypertension was under control. The details are provided in Table 2.

Medication adherence
Medication adherence was calculated using the MMAS-8 scale, according to it 35 (38.9%) had low adherence, while 26 (28.9%) had medium adherence and 29 (32.2%) had high adherence. The details are provided in Table 3.

Medium and poor drug adherence were consolidated since both contributed for non-adherence of medication. Consequently, 61 respondents reported the reasons for non-adherence and 29 respondents for adherence.

The reasons for adherence were availability of support system 10 (34.4%), making medication a habit 8 (27.5%) and keeping medication in sight (17.2%) and the reasons for non-adherence to medications were forgetfulness 25 (41%), difficulty in taking multiple medications 18 (29.5%), and lack of support system 11 (18%) (Figs. 1 and 2).

Factors associated with medication adherence
There was no significant association found between age, gender, marital status, socioeconomic status, and medication adherence. Participants who believed their blood pressure was under control had significantly high adherence. Low adherence was significantly associated with participants who did not receive advice from the health facility and those with comorbidities. The details are provided in Tables 4 and 5.

Non-adherence to the medications which is also termed as an "invisible epidemic" still remains a major limiting factor of hypertension management. This study's purpose was to determine the adherence to antihypertensive medication among patients diagnosed with hypertension and the factors associated with medication adherence using a self-administered questionnaire.

Table 1: Sociodemographic details of the participants

Sociodemographic details	n	%
Age		
18–59	48	53.0
≥60	42	47.0
Gender		
Female	63	70.0
Male	27	30.0
Education		
Illiterate	43	48.0
Primary	10	11.0
Middle	17	18.8
High school	13	14.4
Graduate	7	7.8
Occupation		
Employed	24	26.7
Unemployed	66	73.3
Marital status		
Married	72	80.0
Widow/widower	18	20.0
Living arrangement		
Living alone	13	14.4
Living with family	77	85.6
Socioeconomic status		
Upper	11	12.2
Middle	13	14.4
Lower class	66	73.4

Table 2: Treatment and facility-based factors

Treatment and Facility-based factors	n	%
Duration since diagnosed		
1–5 years	60	66.7
>5 years	30	33.3
Duration since started treatment		
1–5 years	60	66.7
>5 years	30	33.3
No of pills/day		
1	76	84.4
>1	14	15.6
Type of facility		
Government	83	92.2
Both	7	7.8
Distance to facility		
<5 km	72	80.0
>5 km	18	20.0
Advice from facility		
Received	47	52.2
Not received	43	47.8
Addiction history		
Present	20	22.2
Absent	70	77.8
Money spent for tablets		
Yes	7	7.7
No	83	92.2
Money spent by		
Self	4	57.1
Family members	3	42.8
Amount spent		
>500	5	71.4
<500	2	28.5
Comorbidities		
Present	52	57.8
Absent	38	42.2
No of comorbidities		
1	47	90.3
>1	5	9.7
Family history		
Present	42	46.7
Absent	48	53.3
Blood pressure status		
Controlled	63	70
Uncontrolled	27	30

Our study found that 32.2% of the 90 respondents were adherent to their prescribed medications, which was somewhat lower than the adherence levels reported in previous studies conducted by Sheilini *et al.* [9] and Kumar *et al.* [10] in Karnataka, which reported adherence rates of 38.7% and 54.2%, respectively. A study by Lee *et al.* [11] showed an overall adherence rate of about 65.1%, while a previous study in Pakistan, Ethiopia and China by Hashmi *et al.* [4], Ambaw *et al.* [12], and Wan *et al.* [8] found adherence levels of 77%, 64.6%, and 60.1%, respectively. This difference may be due to high literacy levels and older patients, suggesting that age and chronicity plays a role in adherence.

The study revealed that the key factors affecting adherence included having a support system, integrating medication into daily routines, and keeping medication visible. These results align with a study conducted in Pakistan by Hashmi *et al.* [4], which identified similar motivating factors such as having access to a support system and establishing a regular

medication routine. In the study by Kumar *et al.* in Karnataka [10], the reasons for adherence were absence of medication side effects, access to free antihypertensive drugs, and regular blood pressure check-ups.

The non-adherence rate was 67.8% in our study, which is almost similar to the findings of a study conducted by Khadoura *et al.* [13], where the adherence rate was 65.8%. The adherence rate was even lower in the study by Sahoo *et al.*, [7] at 44.6%. Studies carried out by Venkatachalam *et al.* [14] and Tabassum and Rao [15] in South India reported adherence rates of 75.9% and 38.30%, respectively.

Table 3: Medication adherence status to medication using MMAS -8 scale

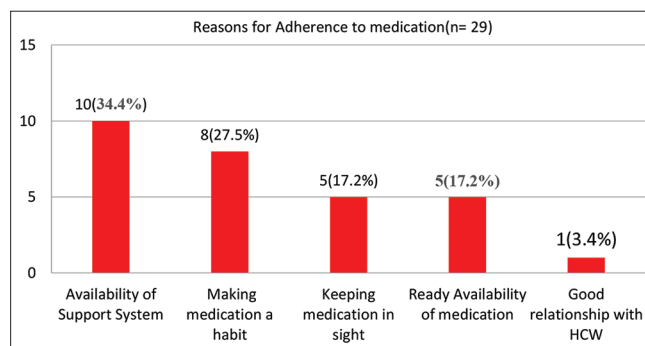| Medication adherence status to medication using MMAS -8 scale (score)	n	%
Low adherence (<6)	35	38.9
Medium adherence (6≤8)	26	28.9
High adherence (8)	29	32.2

Fig. 1: Reasons for adherence to medication

Table 4: Association between socio-demographic factors and adherence to medication

Factors	High n (%)	Medium n (%)	Low n (%)	Chi-square	p-value
Age					
18–59	15 (31.3)	17 (35.4)	16 (33.3)	2.4	0.3
≥60	14 (33.3)	9 (21.4)	19 (45.2)		
Gender					
Female	23 (36.5)	18 (28.6)	22 (34.9)	0.34	0.3
Male	06 (22.2)	08 (29.6)	13 (48.1)		
Occupation					
Employed	08 (33.3)	06 (25.0)	10 (41.7)	4.95	0.08
Unemployed	21 (31.8)	20 (30.3)	25 (37.9)		
Socioeconomic status					
Upper	02 (40.0)	01 (20.0)	02 (40.0)	1.6	0.9
Upper middle	02 (33.4)	01 (16.6)	03 (50.0)		
Middle	03 (23.0)	04 (30.7)	06 (46.1)		
Lower middle	13 (34.2)	12 (31.5)	13 (34.2)		
Lower class	09 (33.3)	5 (18.5)	13 (48.1)		
Living arrangements					
Living alone	04 (30.8)	06 (46.2)	03 (23.1)	4.4	0.1
Living with family	38 (49.4)	15 (19.5)	24 (31.2)		

Table 5: Association between other factors and Adherence to medication

Factors	High n (%)	Mediumn (%)	Low n (%)	Chi-square	p-value
Duration since started treatment					
1–5 years	19 (32.0)	16 (26.5)	25 (41.5)	4.95	0.08
>5 years	10 (33.3)	10 (33.3)	10 (33.3)		
Comorbidities					
Present	10 (19.0)	17 (32.5)	25 (48.5)	9.74	0.007*
Absent	19 (50.0)	09 (23.5)	10 (26.5)		
Blood pressure status					
Controlled	23 (39.7)	19 (32.8)	16 (27.5)	17.18	0.0001*
Uncontrolled	06 (22.1)	07 (21.8)	19 (59.3)		
Family history					
Present	11 (26.3)	13 (30.9)	18 (42.8)	1.32	0.5
Absent	18 (37.5)	13 (27.0)	17 (35.5)		
Advice from the facility					
Received	22 (46.8)	20 (42.5)	05 (10.7)	33.3	0.00001*
Not Received	07 (16.4)	06 (13.9)	30 (69.7)		

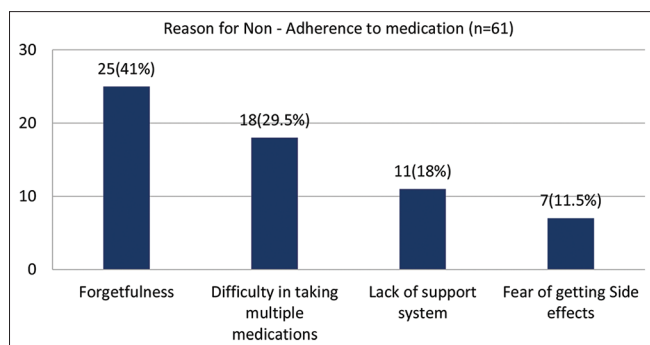*p value <0.05 statistically significant

Fig. 2: Reason for non-adherence to medication

The poor adherence in our study was primarily due to forgetfulness, challenges in managing multiple medications, and experiencing side effects. This is in contrast to the findings of Sahoo *et al.* [7], Venkatachalam *et al.* [14], Sheilini *et al.* [9], and Tabassum and Rao [15] whose studies revealed that poor adherence was due to inconsistent medication supply from government pharmacies, forgetfulness, affordability issues, patients' negligent behavior toward medication intake, and their tendency to discontinue medication when feeling better or worse.

Limitations of the study

The current study has certain limitations. First, as the participants were recruited from a single facility for very small sample size, it may have resulted in a selection bias. Second, as it was a cross-sectional study, it could not prove a causal relationship. Third, there might be over reporting of adherence from the participants.

CONCLUSION

Medication adherence is low in the study population. Factors like blood pressure status, co-morbidities, and advice from the facility play a significant role in medication adherence. The study's primary causes of non-adherence are forgetfulness and the challenge of taking several medications. The adherence level can be further improved by providing health education and efficient counseling during hospital visits and home visits by healthcare workers and drug adherence assessment needs to be an integral component of routine care.

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AUTHOR'S CONTRIBUTION

Dr. Geethanjali P, Dr. Poonam P Shingade, Dr. Amruta Swati I and Dr. Prashant Kumar designed, extracted, analyzed, and interpreted the data. Dr. Geethanjali P, conceived the study; Dr. Poonam P Shingade, Dr. Amruta Swati I and Dr. Prashant Kumar guided the design and supervised the whole research. Dr. Geethanjali P, and Dr. Prashant Kumar also prepared the manuscript. All the authors read and approved the final manuscript.

CONFLICTS OF INTEREST

All authors declare that they do not have any conflicts of interest.

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