



Subject Area : Health Sciences

# TREATMENT ADHERENCE AMONG HYPERTENSIVE PATIENTS IN TERTIARY CARE CENTRE, KURNOOL, ANDHRA PRADESH -A CROSS-SECTIONAL STUDY

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ARTICLE INFO	ABSTRACT
<p>Article History:</p> <p>Received 11<sup>th</sup> December, 2024</p> <p>Received in revised form 26<sup>th</sup> December 2024</p> <p>Accepted 13<sup>th</sup> January, 2025</p> <p>Published online 28<sup>th</sup> January, 2025</p>	<p>Background and Objectives: Optimal blood pressure control is achieved by adherence to treatment. This will reduce the risk of associated morbidities and mortalities. The present study aimed to determine treatment adherence and its association with demographic factors among hypertensive patients attending tertiary care center in Kurnool, Andhra Pradesh. Methods: A cross-sectional hospital based study was conducted among 104 patients by Simple random sampling procedure. A Pre-tested semi-structured questionnaire to assess treatment adherence was used in the present study. Analysis of the data was done using the MS Excel 2007 and SPSS program, version 23. Chi-square was used as a test of significance with a p-value &lt; 0.05 considered significant. Results: Among 104 hypertensive patients 63.5 % were adherent to hypertensive treatment. There was a statistically significant association with gender (0.01), literacy (0.01), living in rural (0.009), and with high socioeconomic status (0.006). Conclusion: The findings revealed that the adherence to hypertensive treatment among hypertensive patients was satisfactory in literates, living in rural areas and those with above the poverty line. The present study results recommend sustained efforts to implement health education programs and awareness-raising interventions targeted at hypertensive patients.</p>
<p><b>Key words:</b></p> <p>Hypertension, Tertiary Care Centre, Treatment adherence</p>	
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## INTRODUCTION

Hypertension, or high blood pressure, is defined as persistently elevated systolic blood pressure of 140 mmHg or higher and/or diastolic blood pressure of 90 mmHg or higher<sup>1</sup>. Globally, approximately 1.13 billion people are affected by hypertension, with 1 in 4 men and 1 in 5 women diagnosed as hypertensive as of 2015. The burden of hypertension is especially significant in low- and middle-income countries<sup>2</sup>. High blood pressure is directly linked to over 8.5 million deaths annually, making it a leading risk factor for conditions such as stroke, ischemic heart disease, kidney disease, and other vascular disorders. Effective management of hypertension is crucial to mitigate these risks<sup>3,4</sup>.

For individuals diagnosed with hypertension, adopting self-care practices is vital. These practices include adherence to prescribed treatments, smoking cessation, following a low-sodium diet, engaging in regular physical activity, and maintaining a healthy weight<sup>5,6</sup>. However, non-adherence to medications poses a major challenge in managing chronic illnesses like hypertension and is a leading cause of treatment failure<sup>7,8</sup>. Despite physicians' best efforts, achieving the desired blood pressure control remains unattainable without patient

compliance with therapeutic recommendations.

In this context, adherence to antihypertensive medications is crucial for effective blood pressure management and the prevention of complications. Data from NFHS-5<sup>9</sup> indicates that Andhra Pradesh is among the states in India with a high prevalence of hypertension. Against this backdrop, the present study aimed to evaluate medication adherence and identify factors influencing adherence among hypertensive patients attending a tertiary care center in Kurnool, Andhra Pradesh.

## Objectives

To determine treatment adherence and its association with socio-demographic factors among hypertensive patients.

## MATERIALS AND METHODS

A hospital-based cross-sectional study was conducted among hypertensive patients who attended the Outpatient Department (OPD) of the Medicine Department, in Kurnool Medical College, Kurnool, during July and August of 2021.

Sample size and Sampling procedure– sample size Calculated by using formula  $n = \frac{4pq}{l^2}$ , where "p" is highly adherence to medication taken as 63% and "l" is Allowable error taken as 15% of "p" (Nazia Tabussum. et al)<sup>10</sup> and the sample size obtained was 104.

By using the Simple random sampling method Hypertensive patients

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above 30 years of age, diagnosed at least 6 months earlier with Hypertension and who gave consent, were selected till the required sample was obtained. Patients who were not willing to participate were excluded from the study.

Data collection – Data was obtained by using a pre-tested, semi-structured questionnaire. The questionnaire consists of 3 parts. The first part contains questions regarding Socio-demographic data like age, gender, literacy status, area of residence, and socio-economic status. For the classification of socio-economic status subjects who had white cards issued by the Government of India were considered as BPL (Below Poverty line), and subjects who had pink cards and who had no card were considered as APL (Above Poverty line). second part is Morisky medication adherence scale-8<sup>(11)</sup>, which contains questions regarding adherence to medication, Score 1 was given for the response NO and score 0 for the response YES for all the questions except for the questions- 5) Did you take your medication yesterday? For which score 1 was given for YES and 0 for NO and 8) How often do you have difficulty remembering to take all your medications? for which score 4 was given for NEVER/RARELY, score 3 for ONCE IN A WHILE, score 2 for SOMETIMES, score 1 for USUALLY, score 0 for ALL THE TIME. Score >6 was considered as good adherence to medication and score <6 was considered as poor adherence to medication. After getting informed written consent from literate participants and informed oral consent from illiterates by explaining the study to them, data was collected by interview method using the questionnaire.

Statistical analysis – Data was analyzed by using Microsoft Excel 2007 and SPSS 23. Descriptive data was presented in terms of percentages and a chi-square test was performed to identify those factors associated with unfavorable self-care practices among hypertensive patients with significant levels ( $p < 0.05$ ).

Ethical approval-The study was approved by the Institutional Ethics Committee .

## RESULTS

The study included a sample of 104 hypertensive patients attending the medicine OPD during the study period. Most of the study participants are above 60 years old, with a mean age of  $56.5 \pm 14.9$  years. There was a male preponderance with 67.3% compared to 32.7% of females, 53.8% of participants were illiterate, 51% of participants belonged to rural areas and 51% of participants were below the poverty line (Table 1).

Table 1 Distribution of study participants based on socio-demographic characteristics (n=104)

Characteristics		Frequency	%
Age	Up to 45	30	28.8
	46-60	30	28.8
	>60	44	42.4
Gender	Female	34	32.7
	Male	70	67.3
Literacy status	Illiterate	56	53.8
	Primary school	7	6.8
	High school	27	25.9
	Intermediate Degree & above	9	8.7
Residence	Rural	53	51.0
	Urban	51	49.0

SES	APL	51	49.0
	BPL	53	51.0

In the present study, it was found that 63.5% of the participants adherent to treatment (Figure 1).

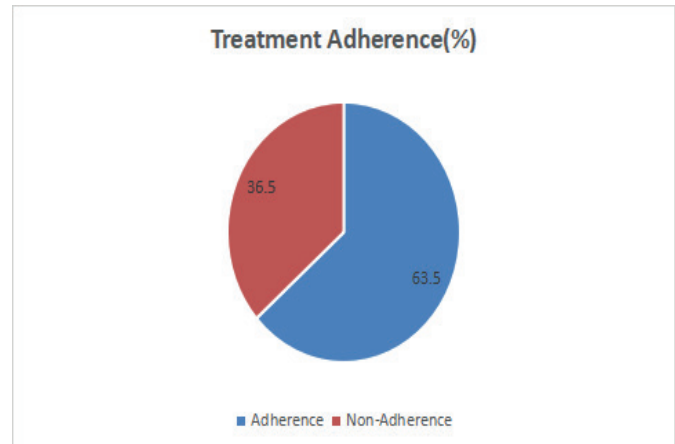


Figure 1 Distribution of treatment adherence among study subjects

Subjects whose age was upto 45 years(73.3%) showed better adherence to medication compared to those in 46-60 years age (66.7%) and >60 years age(54.6%). The association between age and adherence to antihypertensive medication was found statistically not significant ( $p=0.23$ ).

Females (79.4%) showed better adherence to antihypertensive medication compared to males (55.7%), in this study. The association between gender and adherence to antihypertensive medication was found statistically significant ( $p=0.018$ ).

Literates had better adherence to medication compared to illiterates in this study. The association between literacy status and adherence to antihypertensive medication was found to be statistically significant ( $p=0.013$ ).

Subjects living in Rural areas(75.5%) showed better adherence to medication compared to subjects living in urban areas(51%). The association between residence and adherence to antihypertensive medication was found to be statistically significant ( $p=0.009$ ).

Subjects whose socioeconomic status was above the poverty line (76.5%) had better adherence to medication compared to those subjects who were below the poverty line(51%). The association between socioeconomic status and adherence to antihypertensive medication was found to be statistically not significant ( $p=0.006$ ) (Table 2).

## DISCUSSION

In the present study 63.5% of the subjects showed adherence to medication.

Study done by Hema K et al. in Andhra Pradesh<sup>(12)</sup>, only 15.3% of the participants were found to have high adherence to anti-hypertensive medication based on 8 point Morisky medication adherence scale. Study done by R.C. Kumarswamy et al. in a Karnataka<sup>(13)</sup> showed that 74% of the participants were adherent to the antihypertensive medication. Study done by Cheluve Gowda et al in Tumkur<sup>(14)</sup>, showed that 16% subjects had high adherence to medication using MMAS scale.

With respect to age, 73.3% of subjects in age group <45 years

were adherent to medication, 66.7% in age group 45-60 years and 54.6% in age group >60 years. There is no statistically significant association between age and adherence to medication ( $p=0.23$ ). Similarly adherence to medication was better among patients of age group <65 years in study conducted by Mazzaglia G et al<sup>(15)</sup>, where significant association was seen between age and adherence to medication ( $p<0.001$ ). In contrast to the present study, a study by Dr.B.Babu Rao et al(2014)<sup>(16)</sup> showed that adherence rate towards

literate (81.3%) showed better adherence to medication compared to illiterates (48.2%). Similar findings were seen in the study done by Dr.K.Hema et al(2014)<sup>(12)</sup> where literates (44.2%) showed better adherence to medication compared to illiterates (26.4%), where the association between literacy status and adherence to medication was significant ( $p<0.001$ ).

In contrast to this study, Nazia tabassum et al (2017)<sup>(11)</sup> showed that

**Table 2** Sociodemographic factors and their association with treatment adherence (n=104)

Variables	Non Adherence Frequency (%)	Adherence Frequency (%)	Total Number (%)	Chi-square value	P value
AGE(in years)					
Upto 45	8 (26.7)	22 (73.3)	30(28.8)	2.90	0.23
46-60	10 (33.3)	20 (66.7)	30(28.8)		
Above 60	20(45.4)	24(54.6)	44(42.4)		
GENDER					
Female	7 (20.6)	27 (79.4)	34(32.7)	5.54	0.018
Male	31 (44.3)	39 (55.7)	70(67.3)		
LITERACY STATUS					
Illiterate	29 (51.8)	27 (48.2)	56(53.8)	12.59	0.013
Literate	9(48.2)	39(51.8)	48(46.2)		
RESIDENCE					
Rural	13 (24.5)	40 (75.5)	53(51)	6.72	0.009
Urban	25 (49)	26 (51)	51(49)		
SOCIO-ECONOMIC STATUS					
Above Poverty Line	12 (23.5)	39 (76.5)	51(49)	7.30	0.006
Below Poverty Line	26 (49)	27 (51)	53(51)		

antihypertensive Medication was better among patients above 60 years of age (67.2%) and this was found to be statistically significant ( $p=0.02$ , OR= 1.91, CI=3.40-1.08.). Also in contrast to the present study, studies done by Dr.K.Hema et al(2014), in tertiary care hospital Guntur<sup>(12)</sup>, showed better adherence to antihypertensive medications in age group >50 years (46.6%), which was statistically significant ( $p=0.01$ ).

In studies done by Venkatachalam J et al(2015)<sup>(17)</sup>, adherence to antihypertensive medication was more among age group >60 years (27.1%), which was statistically not significant ( $p=0.54$ ). In a study done at Mangalore in a tertiary care hospital by Nithin Kumar et al(2014)<sup>(18)</sup>, adherence was found to be good in the age group of > 60 years but not statistically significant ( $p=0.52$ ).

In this study association between gender and adherence to medication was found to be statistically significant ( $p=0.018$ ). Adherence to antihypertensive treatment was better among females (79.4%), compared to males (55.7%). Similar results were seen in the study of Dr.K.Hema et al(2014) in tertiary care hospital Guntur<sup>(12)</sup>, where better adherence to medication was seen among females (51.6%) and gender was significantly associated with adherence ( $P<0.001$ , OR=3.113, 95% CI). In contrast to this study, Mazzaglia G et al.<sup>(15)</sup> showed better adherence to medication was seen among males compared to females and it was statistically significant ( $p<0.001$ ). Studies done by Dr.B.Babu Rao et al(2014)<sup>(16)</sup>, Siraj Ahmed (2015) in North India ( $P=0.314$ , OR=1.25(0.81-1.94))<sup>(19)</sup>, Venkatachalam J., et al (2015), Kancheepuram District, Tamil Nadu ( $P=0.45$ )<sup>(23)</sup>, Nithin Kumar et al(2014) in Mangalore, South India ( $P=0.48$ , OR=0.8 with CI=0.3-1.6)<sup>(18)</sup> showed there was no

In this study, there was statistically significant association between literacy status and adherence to medication ( $p=0.013$ ) where in,

illiterates (45.74%) showed better adherence to medication compared to literates (15.95%) which was statistically significant. Study done by DR.R.C.kumaraswamy et al(2015)<sup>(13)</sup> showed significant association between educational status and adherence to medication ( $p=0.034$ ).

In the present study, the association between residence and adherence to medication was found to be statistically significant ( $P=0.009$ ). People living in rural areas (75.5%) showed better adherence to medication compared to people living in urban areas (51%). In contrast to this study, findings of DR.R.C.kumaraswamy et al(2015)<sup>(13)</sup> showed people living in urban areas (78.51%) had better adherence to medication compared to people living in rural areas (70.8%), which was statistically significant ( $P=0.045$ ). Similar findings were seen in Cheluve Gowda GK et al(2019)<sup>(14)</sup> where significant association existed between residence and adherence to medication.

In this study, association between socioeconomic status and adherence to medication was found to be statistically significant ( $p=0.006$ ). Subjects who were Above the poverty line (76.5%) showed better adherence to medication compared to subjects who were below the poverty line (51%). Similar findings were seen in study conducted by Siraj Ahmad et al(2015)<sup>(19)</sup>, where upper middle class (65.1%) showed better adherence to medication compared to lower middle class (42.2%), where significant association was seen between socioeconomic status and adherence to medication ( $p<0.001$ , OR=2.55(1.61-4.05)). In contrast to this study, study of Dr.K.Hema et al(2014)<sup>(12)</sup> had better adherence to medications among people who belonged to lower socioeconomic status (40.4%) compared to higher socioeconomic status (33.6%), where association between socioeconomic status and adherence to medication was found to be insignificant ( $p=0.09$ ). In contrast to this study, studies conducted by Nithin Kumar et al(2014) ( $p=0.153$ ) in Mangalore, South

India<sup>(18)</sup>; Sneha D.Mallya et al(2016)(p=1.00) in Karnataka<sup>(20)</sup>, by Dr.B.Babu Rao et al(2014) (p=0.55) in Hyderabad<sup>(16)</sup> there was no significant association between socioeconomic status and adherence to medication.

## CONCLUSIONS

Treatment adherence among hypertensives were satisfactory. Nearly two-thirds were adherent to treatment. But poor adherence to treatment found among males, residing in urban and with a lower economic status. These groups must be better counselled and further monitored during routine health care delivery services.

## Limitations

This study was a cross-sectional and hospital-based study so the sample might not exactly reflect the community

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Conflict of interest: None declared

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